SOIL SURVEY OF

New Haven County, Connecticut

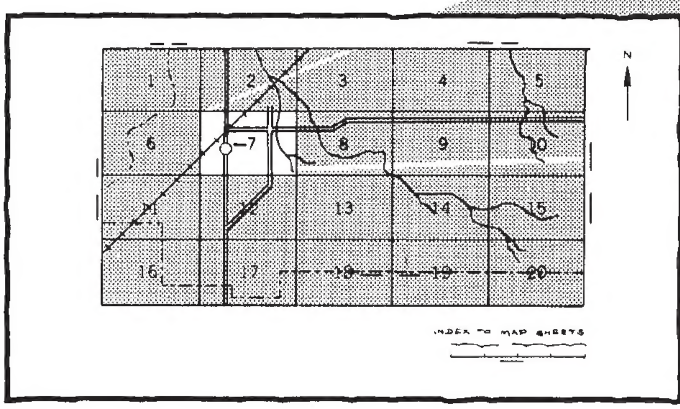
United States Department of Agriculture, Soil Conservation Service

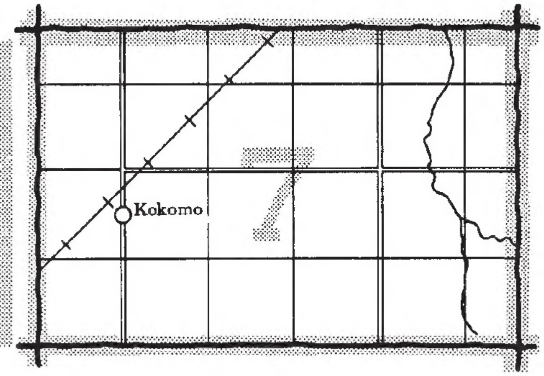
in cooperation with

Connecticut Agricultural Experiment Station and Storrs Agricultural Experiment Station

HOW TO USE

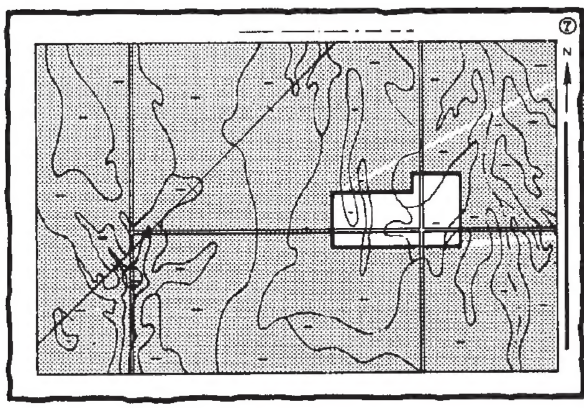
1. Locate your area of interest on the "Index to Map Sheets" (the last page of this publication).

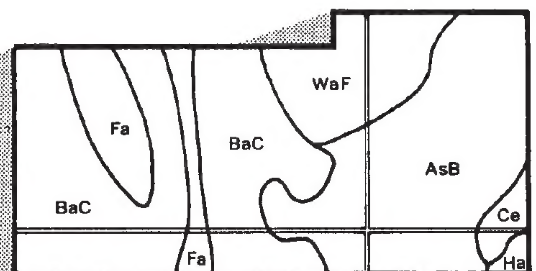




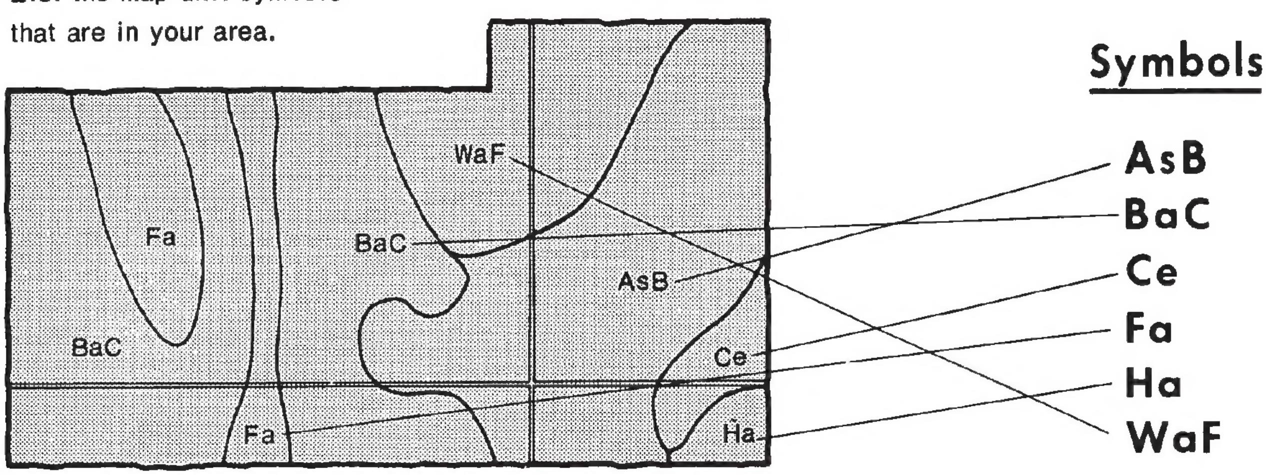
2. Note the number of the map sheet and turn to that sheet.

3. Locate your area of interest on the map sheet.



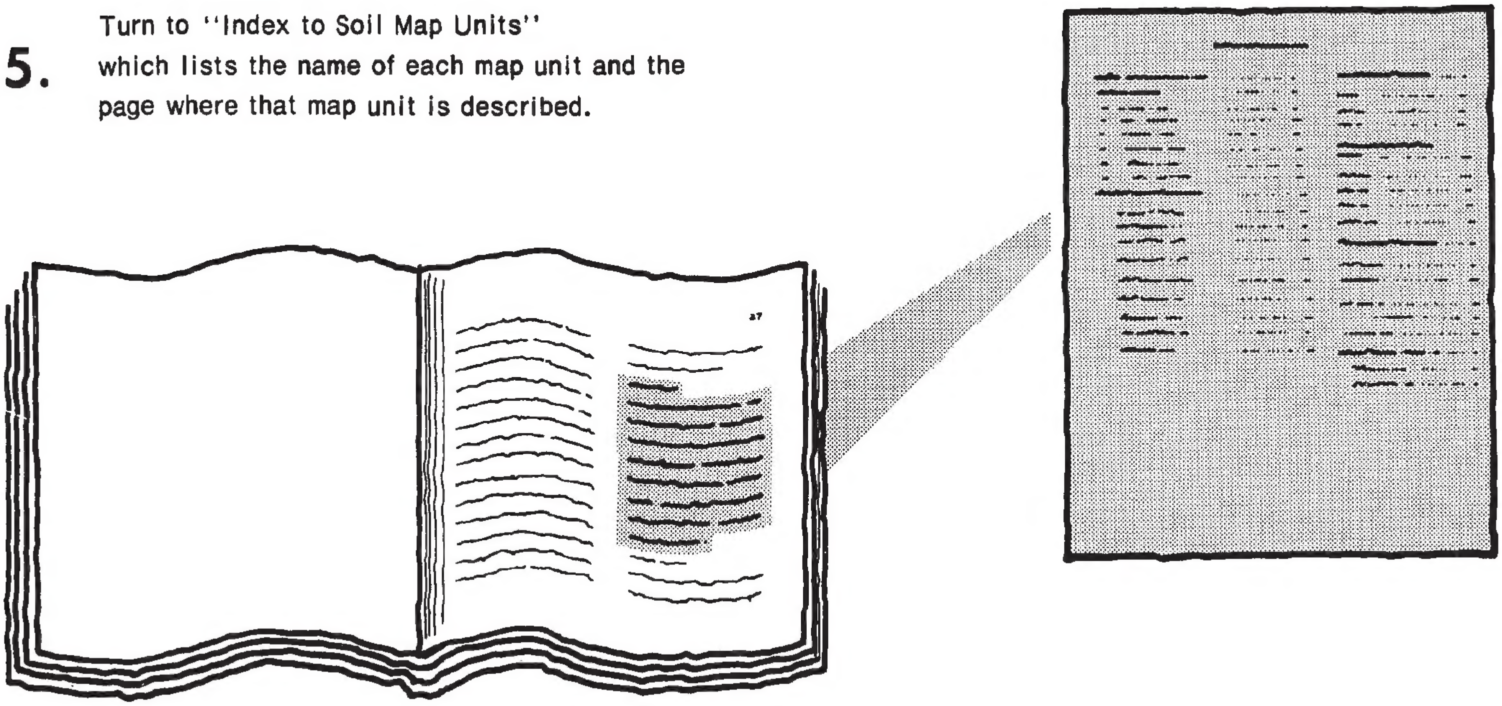


4. List the map unit symbols that are in your area.

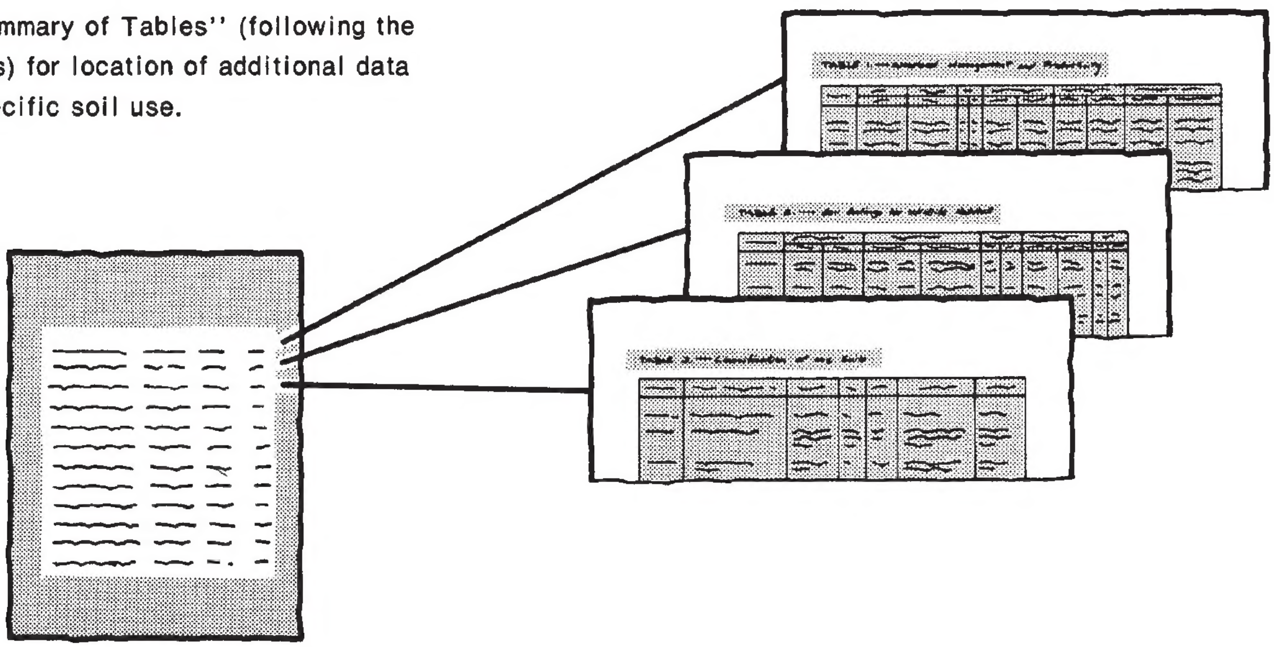


THIS SOIL SURVEY

5. Turn to "Index to Soil Map Units" which lists the name of each map unit and the page where that map unit is described.



6. See "Summary of Tables" (following the Contents) for location of additional data on a specific soil use.



7. Consult "Contents" for parts of the publication that will meet your specific needs. This survey contains useful information for farmers or ranchers, foresters or agronomists; for planners, community decision makers, engineers, developers, builders, or homebuyers; for conservationists, recreationists, teachers, or students; to specialists in wildlife management, waste disposal, or pollution control.

This is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and agencies of the States, usually the Agricultural Experiment Stations. In some surveys, other Federal and local agencies also contribute. The Soil Conservation Service has leadership for the Federal part of the National Cooperative Soil Survey. In line with Department of Agriculture policies, benefits of this program are available to all, regardless of race, color, national origin, sex, religion, marital status, or age.

Major fieldwork for this soil survey was completed in the period 1967-75. Soil names and descriptions were approved in 1976. Unless otherwise indicated, statements in the publication refer to conditions in the survey area in 1975. This survey was made cooperatively by the Soil Conservation Service, the Connecticut Agricultural Experiment Station, and the Storrs Agricultural Experiment Station. It is part of the technical assistance furnished to the New Haven County Soil and Water Conservation District.

Soil maps in this survey may be copied without permission, but any enlargement of these maps could cause misunderstanding of the detail of mapping and result in erroneous interpretations. Enlarged maps do not show small areas of contrasting soils that could have been shown at a larger mapping scale.

Cover: Upper left—An area in the Cheshire-Yalesville map unit near the town of Wallingford. The area is used for farming. Upper right—An area of Agawam fine sandy loam, 0 to 3 percent slopes, in the town of Guilford. The area is used mainly for community development. Lower left—An area of Beaches along Long Island Sound in the town of East Haven. The area is used for recreation. Lower right—An area in the Holyoke-Rock outcrop-Cheshire map unit near the town of Meriden. A large part of this map unit is woodland.

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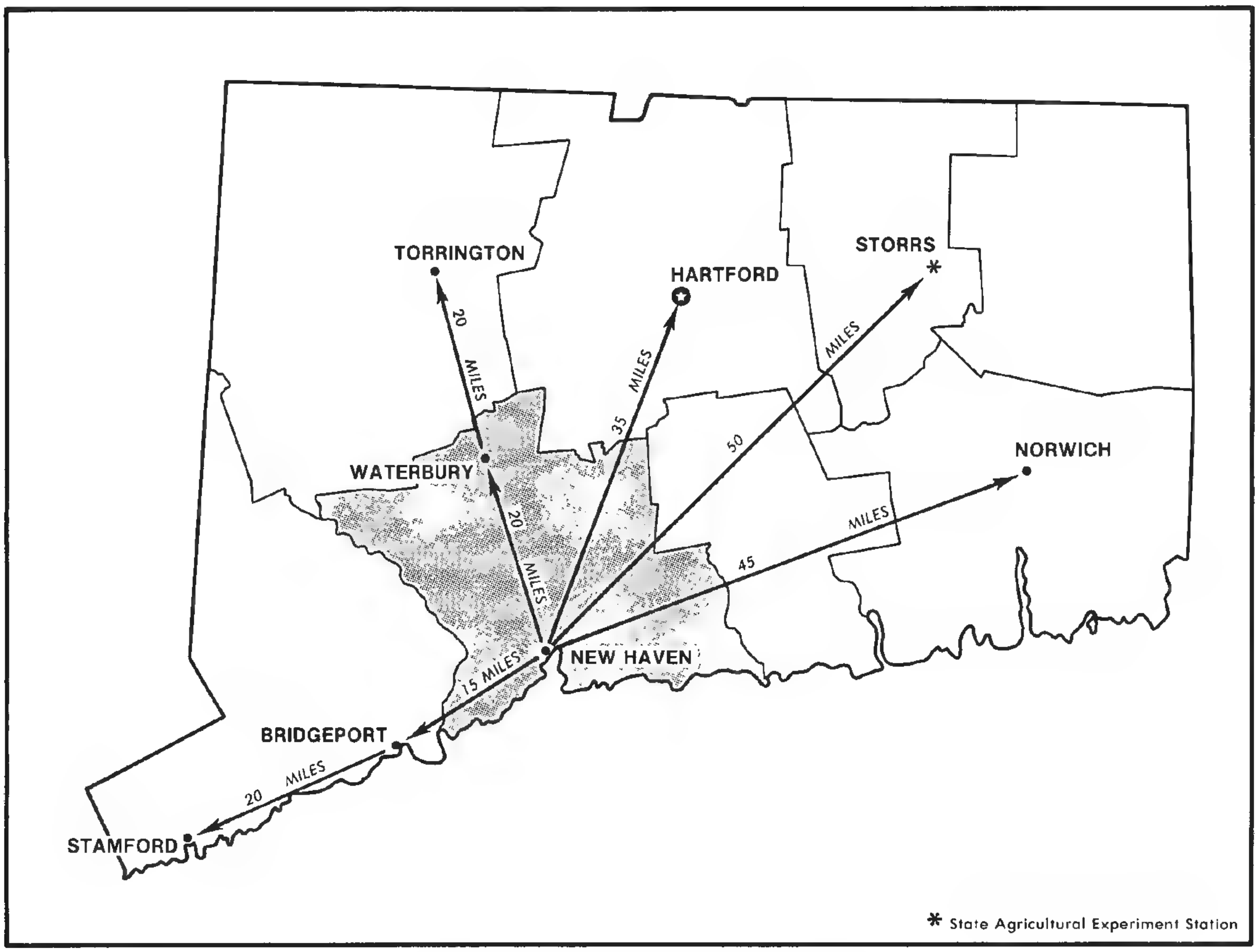
Foreword

The Soil Survey of New Haven County can help you and your community to use wisely one of the area's most valuable natural resources—the soil.

This soil survey can help you to locate areas suitable for waste disposal systems and to evaluate tracts of land for houses and residential developments, wildlife habitat, forestry, and recreational uses. The survey can help in planning highway corridors and underground pipeline, sewer, and cable systems. It can also be useful in identifying and locating wetlands, important farmlands, and floodprone areas, and it provides erosion and sedimentation data.

This soil survey, along with other natural resource information, can help in maintaining a quality environment for all the people of New Haven County.

John W. Tippie
State Conservationist
Soil Conservation Service



Location of New Haven County in Connecticut.

SOIL SURVEY OF NEW HAVEN COUNTY, CONNECTICUT

By Charles A. Reynolds, Soil Conservation Service

Soils surveyed by Charles A. Reynolds and Kenneth C. Stevens, Soil Conservation Service. Others participating in the field survey were William H. Brug, Walter N. Gonick, William Ireland, Jr., Enden L. Milliron, Angel J. Santana, Dale Sprankle, Mark A. Townsend, J. C. True, and Barrie L. Wolf, Soil Conservation Service

United States Department of Agriculture, Soil Conservation Service, in cooperation with Connecticut Agricultural Experiment Station and Storrs Agricultural Experiment Station

NEW HAVEN COUNTY is in the south central part of Connecticut. It is bordered on the south by Long Island Sound. The county is made up of 27 towns and has a land area of 390,400 acres, or 610 square miles. It is entirely within the New England physiographic province and consists of parts of two sections: the New England Upland section in the western and eastern parts of the county and the Connecticut Valley Lowland section in the central part of the county.

The main rivers flowing through New Haven County are the Housatonic River along the western edge of the county, the Quinnipiac River flowing from north to south through the central part of the county, and the Hammonasset River along the eastern edge of the county.

In 1970 the population of the county was 744,948. New Haven, with a population of 137,707, is the largest city. It is the county seat, although there have not been any county governments in Connecticut since 1960.

Commerce and industry are the main enterprises in New Haven County. Farming is still important. Dairying and growing vegetables and orchard fruits are the main farm enterprises. Of lesser importance in the county are forest products, greenhouse products, growing nursery stock, and raising poultry.

General nature of the county

In this section, the settlement and growth of New Haven County are briefly discussed, and information is given about industry, transportation, markets, and agriculture. Also in this section, climate and its effect on farming are discussed.

Settlement and growth

New Haven County was formed in 1666. It was one of the first four counties in the state. Settlement of the county began in 1638 with the establishment of the New Haven colony. Colonists soon after that traveled up the Quinnipiac and Housatonic Rivers and settled in the northern parts of the county.

The early growth of the county consisted mainly of the expanded acreage used for farming. Some of the earliest industries were grinding mills, weavers, tailors, bakers, and brick makers, all of which were in the southern part of the county near the settlement of New Haven. Later, the use of water power and the railroads brought more industry and more commercial development.

General farming was dominant in the county until about 1875 when some farmers turned to dairying, raising poultry, and orchards.

Industry, transportation, and markets

Commerce and industry are main enterprises in the county. They are located mainly in the Quinnipiac River Valley from Meriden to New Haven, in the Naugatuck River Valley from Derby to Waterbury, and in the towns bordering Long Island Sound from Branford to Milford. Some towns have little industry but are heavily populated residential communities. Principal manufactured goods include wire, brass products, silver products, aircraft engines, firearms, and parts for aircraft and for electrical equipment.

Rock quarries in North Branford and Wallingford produce crushed rock for road building and other use. Much of the rock is shipped out of the county and out of the state. Washed sand and gravel are mined in several places and used locally for various construction purposes.

New Haven County has a good road network; Interstate Highways 84, 91, and 95 pass through the county, and there are several U.S. and State highways. The county is served by major railroad lines, one running east-west in the southern part of the county and one running north-south from New Haven to Meriden and on through northern New England. Several smaller railroad

lines connect other points in the county. In addition, the county is served by bus lines. Tweed-New Haven Airport is the only major commercial airport in the county. New Haven harbor serves ocean-going vessels the year round.

The county has easy access to markets in Hartford, Connecticut; New York City, about 75 miles to the southwest; Providence, Rhode Island, about 100 miles to the east; and Boston, Massachusetts, about 130 miles to the northeast.

Agriculture

Although farming has been decreasing in the county, it is still important, especially in the northwestern part. Dairying is the major farm enterprise. Corn and forage crops are grown extensively to provide feed for dairy cattle. Many vegetable farms, mostly of small acreage and near the urban parts of the county, produce many of the fresh vegetables used locally during the growing season. Many vegetables are shipped from the county to other urban markets. Orchards, mainly in the central and southern parts of the county, produce apples, peaches, and pears that are sold locally. A significant amount of apples is exported each year. Other crops grown in the county include greenhouse products, nursery stock, and berries.

The largest tracts of woodland are in the western and eastern parts of the county. Many large tracts are owned by water supply companies and are used as watersheds to collect and provide water to municipalities. The woodlands supply lumber and other wood products and have been used increasingly in recent years for the production of firewood. Many wooded tracts are also highly desirable as homesites for the expanding population of southern Connecticut.

Climate

In New Haven County, winters are cold and summers are warm. Both the beginning and the end of the warm period are somewhat delayed by the moderating influence of the Atlantic Ocean. In winter the ground is frequently but not continuously covered with snow. Total annual precipitation is nearly always adequate for the crops grown in the county.

Table 1 gives data on temperature and precipitation for the survey area, as recorded at Mt. Carmel, Connecticut, for the period 1951 to 1973. Table 2 shows probable dates of the first freeze in fall and the last freeze in spring. Table 3 provides data on length of the growing season.

In winter the average temperature is 29 degrees F, and the average daily minimum is 20 degrees. The lowest temperature on record, 17 degrees below zero, occurred at Mt. Carmel on January 22, 1961. In summer the average temperature is 70 degrees, and the average daily maximum is 81 degrees. The highest temperature, 100 degrees, was recorded on July 22, 1957.

Growing degree days, shown in table 1, are equivalent to "heat units." Beginning in spring, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (40 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

As shown in table 1, the average annual precipitation is nearly 47 inches. Of this, 23 inches, or 49 percent, usually falls in the period April through September, which includes the growing season for most crops. In about 2 years in 10, the rainfall in April through September is less than 19 inches. The heaviest 1-day rainfall during the period of record was 6.70 inches at Mt. Carmel on September 12, 1960. There are about 22 thunderstorms each year, 13 of which occur in summer.

The average seasonal snowfall is 32 inches. The greatest snow depth at any one time during the period of record was 21 inches. On the average, 23 days have at least 1 inch of snow on the ground, but the number of days varies greatly from year to year.

The average relative humidity in midafternoon is about 60 percent. Humidity is higher at night, and the average at dawn is about 75 percent. The prevailing wind is from the southwest. Average windspeed is highest, 14 miles per hour, in February.

Winter storms moving northeastward along the coast frequently bring rain and thawing and then snow and cold weather. In summer, sea breezes frequently moderate the temperature, particularly near the coast.

How this survey was made

Soil scientists made this survey to learn what kinds of soil are in the survey area, where they are, and how they can be used. The soil scientists went into the area knowing they likely would locate many soils they already knew something about and perhaps identify some they had never seen before. They observed the steepness, length, and shape of slopes; the size of streams and the general pattern of drainage; the kinds of native plants or crops; the kinds of rock; and many facts about the soils. They dug many holes to expose soil profiles. A profile is the sequence of natural layers, or horizons, in a soil; it extends from the surface down into the parent material, which has been changed very little by leaching or by the action of plant roots.

The soil scientists recorded the characteristics of the profiles they studied, and they compared those profiles with others in counties nearby and in places more distant. Thus, through correlation, they classified and named the soils according to nationwide, uniform procedures.

After a guide for classifying and naming the soils was worked out, the soil scientists drew the boundaries of the individual soils on aerial photographs. These photographs show woodlands, buildings, field borders, roads, and other details that help in drawing boundaries accurately. The soil map at the back of this publication was prepared from aerial photographs.

The areas shown on a soil map are called soil map units. Some map units are made up of one kind of soil, others are made up of two or more kinds of soil, and a few have little or no soil material at all. Map units are discussed in the sections "General soil map for broad land use planning" and "Soil maps for detailed planning."

While a soil survey is in progress, samples of soils are taken as needed for laboratory measurements and for engineering tests. The soils are field tested, and interpretations of their behavior are modified as necessary during the course of the survey. New interpretations are added to meet local needs, mainly through field observations of different kinds of soil in different uses under different levels of management. Also, data are assembled from other sources, such as test results, records, field experience, and information available from state and local specialists. For example, data on crop yields under defined practices are assembled from farm records and from field or plot experiments on the same kinds of soil.

But only part of a soil survey is done when the soils have been named, described, interpreted, and delineated on aerial photographs and when the laboratory data and other data have been assembled. The mass of detailed information then needs to be organized so that it is readily available to different groups of users, among them farmers, managers of rangeland and woodland, engineers, planners, developers and builders, home buyers, and those seeking recreation.

General soil map for broad land use planning

The general soil map at the back of this publication shows, in color, map units that have a distinct pattern of soils and of relief and drainage. Each map unit is a unique natural landscape. Typically, a map unit consists of one or more major soils and some minor soils. It is named for the major soils. The soils making up one unit can occur in other units but in a different pattern.

The general soil map provides a broad perspective of the soils and landscapes in the survey area. It provides a basis for comparing the potential of large areas for general kinds of land use. Areas that are, for the most part, suited to certain kinds of farming or to other land uses can be identified on the map. Likewise, areas of soils having properties that are distinctly unfavorable for certain land uses can be located.

Because of its small scale, the map does not show the kind of soil at a specific site. Thus, it is not suitable for planning the management of a farm or field or for selecting a site for a road or building or other structure. The kinds of soil in any one map unit differ from place to place in slope, depth, stoniness, drainage, or other characteristics that affect their management.

Soils of the New England Uplands that formed mainly in material that weathered from gneiss and schist

These soils are mainly in the western part of the county; some are in the eastern part in the towns of Guilford and Madison (*5*). Most of the soils formed in glacial till, and some formed in glacial outwash. Considerable acreage of organic soils and of alluvial soils is included. Most of the farmland and woodland in the county is on these soils.

1. Paxton-Woodbridge-Ridgebury

Nearly level to steep, well drained to poorly drained, loamy soils that have a fragipan; on drumloidal glacial till uplands

This map unit (fig. 1) makes up about 11 percent of the county. It is mainly in the western half of the county. Small areas are in the southeastern part in the towns of Madison and Guilford. The landscape is mainly drumloidal; ridges and hills extend primarily in a north-south direction.

Paxton soils make up about 45 percent of this map unit. They are deep, well drained, and loamy and have a slowly permeable fragipan. They are gently sloping to steep and are in convex positions on the landscape. Stones and boulders are common on the surface in places.

Woodbridge soils make up about 25 percent of this map unit. They are deep, moderately well drained, loamy, and have a slowly permeable fragipan. They have a seasonal water table at a depth of 20 inches. These soils are mostly nearly level or gently sloping and are on the top of broad hills and in slightly concave positions. Stones and boulders are common on the surface in many wooded areas.

Ridgebury soils make up 15 percent of this map unit. They are deep, poorly drained, loamy, and have a slowly permeable fragipan. They have a seasonal water table at a depth of about 8 inches. The Ridgebury soils are dominantly nearly level or gently sloping and are in concave areas in depressions, on the top of broad, nearly level hills, and in drainageways. Stones and boulders are common on the surface in most places.

Minor soils make up the remaining 15 percent of this map unit. These are mainly the Hollis, Charlton, Whitman, and Palms soils. Hollis soils are on the top and the steep sides of hills and ridges. Charlton soils are in

positions similar to those of Paxton soils. Whitman soils are very poorly drained and are in the lower depressions on the landscape. Palms soils are very poorly drained and occupy the lowest depressions on the landscape.

Most areas have been cleared of trees and stones and were once farmed. Many areas are still used for hay, corn, vegetables, and orchards. An increasing acreage is being used for community development or is left idle, particularly near urban areas. Most steep areas and areas that have stones and boulders on the surface are in woodland or pasture.

This map unit has good potential for community development; however, the major soils have poor potential for onsite septic systems because of the slowly permeable fragipan and the seasonally high water table of the Woodbridge and Ridgebury soils. This map unit has good potential for farming and for trees.

2. Charlton-Hollis-Leicester

Gently sloping to steep, somewhat excessively drained to poorly drained, loamy soils; on broad glacial till plains

This map unit makes up about 21 percent of the county. It is mainly in the western half of the county; small areas are in the southeastern part in the towns of Madison and Guilford. The landscape is mainly undulating uplands; low hills and ridges, many of which have relief that is affected by the underlying bedrock, extend primarily in a north-south direction.

Charlton soils make up about 35 percent of this map unit. They are deep, well drained, and loamy. They are dominantly gently sloping or sloping and occupy hilltops and convex side slopes of the till plain. Stones and boulders are common on the surface in places.

Hollis soils make up about 30 percent of the map unit. They are somewhat excessively drained, loamy, and underlain by bedrock at a depth of 10 to 20 inches. Hollis soils are gently sloping to steep and occupy hilltops, small ridges, and side slopes in bedrock-controlled areas. Slopes are mainly complex. Stones and boulders are on the surface, and bedrock outcrops are common in most places.

Leicester soils make up about 10 percent of this map unit. They are deep and loamy, but unlike Charlton and Hollis soils they are poorly drained. Leicester soils are dominantly nearly level or gently sloping and occupy depressions and drainageways. Stones and boulders are common on the surface in most places.

Minor soils make up the remaining 25 percent of this map unit. These are mainly the Agawam, Sutton, Paxton, Woodbridge, and Palms soils. Agawam soils are underlain by sand and gravel and occupy small terraces along streams. Sutton soils are moderately well drained and occupy concave and slightly depressional areas on the till plain. Paxton and Woodbridge soils have a slowly permeable fragipan and occupy small drumloidal positions on the till plain. Palms soils are very poorly drained and have 16 to 50 inches of organic deposits over mineral soil material. Palms soils are in the lowest depressions on the landscape.

Much of this map unit has been cleared of trees and stones and was once used for farming. Many areas are still used for hay, corn, vegetables, and orchards. An increasing acreage is being used for community development or is left idle, particularly in the southern part of the county. Many areas of Hollis soils and areas having stones and boulders on the surface are in woodland.

This map unit has fair potential for community development. It is limited mainly by the shallowness to bedrock of Hollis soils and the wetness of Leicester soils. Areas of steep slopes have poor potential for community development. This map unit has good potential for farming and for trees.

3. Hollis-Charlton-Rock outcrop

Gently sloping to very steep, somewhat excessively drained and well drained, loamy soils; on glacial till uplands where the relief is affected by the underlying bedrock

This map unit (fig. 2) makes up about 16 percent of the county. It is mainly in the western half of the county. A smaller acreage is in the southeastern part in the towns of Madison and Guilford. The landscape is mainly steep ridges, hills, and knolls that extend primarily in a north-south direction. The relief is affected by the underlying bedrock.

Hollis soils make up about 35 percent of this map unit. They are somewhat excessively drained, loamy soils and are underlain by bedrock at a depth of 10 to 20 inches. Hollis soils are dominantly sloping to very steep and occupy the ridgetops, knolls, and side slopes of the rougher areas of the landscape. Stones and boulders are on the surface, and bedrock outcrops are common in most places.

Charlton soils make up about 30 percent of this map unit. They are well drained, deep, loamy soils. Charlton soils are mostly gently sloping or sloping and occupy small, smooth hilltops and small areas between bedrock-controlled ridges and knolls. Stones and boulders are common in many places.

Rock outcrop makes up about 15 percent of this map unit. It is exposed unweathered bedrock, mostly gneiss and schist, on narrow ridgetops, on the top of knolls, or on steep side slopes. Slopes are mostly very steep. Stones and boulders are common on the surface in most places.

Minor soils make up the remaining 20 percent of this map unit. They are mainly Paxton, Sutton, Leicester, and Carlisle soils. Paxton soils are well drained and are on smooth, rounded hilltops. Sutton soils are moderately well drained and are in concave and slightly depressional areas, mainly between bedrock ridges and knolls. Leicester soils are poorly drained; they are in drain-

ageways and depressions. Carlisle soils are very poorly drained; they are organic soils that formed in organic deposits thicker than 50 inches. They are in the lowest depressions on the landscape.

This map unit is poorly suited to farming; only small areas have been cleared for this use. Most areas are woodland. This map unit has poor potential for community development. It is limited mainly by shallowness to bedrock, steep slopes, and rock outcrops.

4. Agawam-Hinckley-Walpole

Nearly level to sloping, excessively drained to poorly drained, loamy and sandy soils; on glacial outwash plains and terraces

This map unit makes up about 10 percent of the county. It is mainly in the western part of the county. A smaller acreage is in the southeastern part, mainly in the towns of Madison and Guilford.

Agawam soils make up about 30 percent of this map unit. They are deep, well drained, loamy soils underlain by sand and gravel at a depth of about 22 inches. They are nearly level to sloping and occupy broad terraces.

Hinckley soils make up about 25 percent of this map unit. They are deep, excessively drained, coarse textured soils that formed in sand and gravel. They are nearly level to sloping and occupy terraces of the narrow stream valleys.

Walpole soils make up about 10 percent of this map unit. They are deep, poorly drained, sandy soils. They are nearly level and occupy low depressions of glacial outwash plains and terraces.

Minor soils make up the remaining 35 percent of this map unit. They are mainly the Haven, Ninigret, Charlton, Rumney, Adrian, and Westbrook soils. Haven soils are similar to Agawam soils and are on the same landscape. Ninigret soils are moderately well drained and occupy slight depressions on the landscape. Charlton soils formed in loamy glacial till and occupy small glacial till hills. Rumney soils are poorly drained alluvial soils on flood plains adjacent to streams. Adrian soils have 16 to 50 inches of organic deposits over mineral material; they are in the lowest depressions on the landscape. Westbrook soils are in coves adjacent to Long Island Sound and are subject to daily tidal flooding.

Most areas of this map unit have been cleared and were used for farming at one time. Many areas are now used for community development or are idle. A few areas are used for vegetables, hay, corn, orchards, and pasture. The poorly drained soils are mostly in woodland.

This map unit has good potential for community development, farming, and trees.

Soils of the Connecticut Valley Lowlands that formed mainly in material that weathered from Triassic sandstone and conglomerate

These soils are mainly in the central part of the county in a broad area extending from New Haven to Meriden (*5*). Most of the soils formed in glacial till or glacial outwash. Considerable acreage of alluvial soils is included in most of the map units. Most of the urban population and many industries are concentrated in this part of the county. Most of the vegetable crops and orchards are grown on these soils. A large acreage in the northern part is used for general farming.

5. Wethersfield-Ludlow-Wilbraham

Nearly level to steep, well drained to poorly drained, loamy soils that have a fragipan; on drumloidal glacial till uplands

This map unit makes up about 6 percent of the county. It is located throughout the central part of the county in the Connecticut Valley Lowlands. The landscape is mainly drumloidal; ridges and hills extend primarily in a north-south direction.

Wethersfield soils make up about 40 percent of this map unit. They are deep, well drained, loamy soils and have a slowly or very slowly permeable fragipan. Wethersfield soils are gently sloping to steep and occupy convex positions on the landscape.

Ludlow soils make up about 25 percent of this map unit. They are deep, moderately well drained, loamy soils and have a slowly or very slowly permeable fragipan. They have a seasonal high water table at a depth of about 20 inches. Ludlow soils are mostly nearly level or gently sloping; they are on the top of nearly level hills or in concave positions toward the base of slopes.

Wilbraham soils make up about 15 percent of this map unit. They are deep, poorly drained, loamy soils and have a slowly or very slowly permeable fragipan. Wilbraham soils are nearly level or gently sloping and are in concave and depressional areas in drainageways and on the top of very broad, nearly level hills.

Minor soils make up the remaining 20 percent of this map unit. They are mainly the Yalesville, Cheshire, Branford, Holyoke, and Carlisle soils. Yalesville soils have bedrock at a depth of 20 to 40 inches. Cheshire soils are on a landscape similar to that of Wethersfield soils; Cheshire soils have a more friable substratum. Branford soils are on small terraces adjacent to streams. Holyoke soils are on the higher parts of the landscape and have bedrock at a depth of 10 to 20 inches. Carlisle soils formed in organic deposits thicker than 50 inches; they are in the lowest positions on the landscape.

Most of this map unit has been cleared of trees and was once used for farming. An increasing acreage is

being used for community development. A few areas are still used for hay, corn, vegetables, orchards, and nursery stock. Most steep areas and areas of Wilbraham soils are in woodland or are used for pasture.

This map unit has good potential for community development; however, the major soils have poor potential for onsite septic disposal systems because of the slowly or very slowly permeable fragipan and the seasonal high water table of the Ludlow and Wilbraham soils. This map unit has good potential for farming and growing trees.

6. Cheshire-Yalesville

Gently sloping to steep, well drained, loamy soils; on broad glacial till plains

This map unit makes up about 8 percent of the county. It is located throughout the Connecticut Valley Lowlands in the central part of the county. The landscape is mainly undulating uplands; low hills and ridges, some of which are in areas where the relief is affected by the underlying bedrock, extend mostly in a north-south direction.

Cheshire soils make up about 35 percent of this map unit. They are deep, well drained, loamy soils. Cheshire soils are gently sloping to steep and occupy the more rounded hilltops and convex slopes of the glacial till plain. Stones and boulders are common on the surface in places.

Yalesville soils make up 30 percent of this map unit. They have bedrock at a depth of 20 to 40 inches and are well drained, loamy soils. Yalesville soils are in the higher, almost flat areas of the glacial till plain and on narrow low ridges. The slopes are mostly convex.

Minor soils make up the remaining 35 percent of this map unit. They are mainly the Wethersfield, Holyoke, Ludlow, Wilbraham, and Branford soils. Wethersfield soils are on similar landscapes but have a slowly or very slowly permeable fragipan. Holyoke soils are on the steeper ridges and knobs. Ludlow soils are moderately well drained and have a slowly or very slowly permeable fragipan. Wilbraham soils are poorly drained and have a slowly or very slowly permeable fragipan. Branford soils are well drained; they are on small terraces adjacent to streams.

Most of this map unit has been cleared and was once used for farming. Many areas have grown back to woodland. A rapidly increasing acreage is being used for community development.

This map unit has good potential for community development. Yalesville soils have poor potential for onsite septic systems and excavations because bedrock is at a depth of 20 to 40 inches. This map unit has good potential for farming and for trees.

7. Cheshire-Holyoke

Gently sloping to steep, somewhat excessively drained and well drained, loamy soils; on broad glacial till plains where the relief is affected by the underlying bedrock

This map unit makes up about 7 percent of the county. It is located throughout the Connecticut Valley Lowlands in the central part of the county. The landscape is mainly undulating low hills and ridges on uplands. The relief is affected by the underlying bedrock.

Cheshire soils make up about 40 percent of this map unit. They are deep, well drained, loamy soils. Cheshire soils are gently sloping to steep and occupy the rounded hilltops and convex slopes of the glacial till plain. They also occupy areas between narrow bedrock ridges. Stones and boulders are common on the surface in many places.

Holyoke soils make up about 30 percent of this map unit. They are excessively drained, loamy soils and have bedrock at a depth of 10 to 20 inches. They occupy narrow ridges, knobs, and hilltops. The slopes are convex.

Minor soils make up the remaining 30 percent of this map unit. They are mainly the Yalesville, Wethersfield, Watchaug, Wilbraham, and Branford soils. There are rock outcrops in a few places. Yalesville soils are well drained and have bedrock at a depth of 20 to 40 inches. Wethersfield soils are on smoothly rounded hilltops and have a slowly or very slowly permeable fragipan. Watchaug soils are moderately well drained and occupy concave slopes and slightly depressional areas. Wilbraham soils are poorly drained and are in drainageways and depressions. Branford soils are well drained and are on small terraces adjacent to streams.

About one-half of this map unit has been cleared and was used for farming at one time. An increasing acreage is being used for community development. A few areas are still being used for hay, corn, vegetables, and orchards. Some of the acreage is woodland.

This map unit has fair potential for community development. Holyoke soils have poor potential for community development, farming, and trees because bedrock is at a depth of 10 to 20 inches. Cheshire soils have good potential for farming and trees.

8. Holyoke-Rock outcrop-Cheshire

Gently sloping to very steep, somewhat excessively drained and well drained, loamy soils and Rock outcrop; on glacial till uplands where the relief is affected by the underlying bedrock

This map unit makes up about 6 percent of the county. It is located throughout the Connecticut Valley Lowlands in the central part of the county. The landscape is mainly steep, rough uplands that have long ridges and knobs of exposed bedrock. The relief is affected by the underlying bedrock.

Holyoke soils make up about 35 percent of this map unit. They are excessively drained, loamy soils that have bedrock at a depth of 10 to 20 inches. They are on the top of the broader ridges and on the more gently sloping side slopes of ridges and hills.

Rock outcrop makes up about 20 percent of this map unit. The areas of bare exposed bedrock are on the very steep sides of ridges and on the top of a few ridges and hills.

Cheshire soils make up 20 percent of this map unit. They are deep, well drained, loamy soils on the lower hills and in areas between the bedrock-controlled ridges.

Minor soils make up the remaining 25 percent of this map unit. They are mainly the Yalesville, Wilbraham, Wethersfield, and Watchaug soils. Yalesville soils are well drained, loamy soils that have bedrock at a depth of 20 to 40 inches. Wilbraham soils are deep, poorly drained, loamy soils in drainageways and depressions. Wethersfield soils are deep, well drained, and loamy; they have a slowly or very slowly permeable fragipan. They occupy small, smooth, rounded hilltops. Watchaug soils are deep, moderately well drained, and loamy. They are in slight depressions and on the lower concave slopes adjacent to the base of ridges and hills.

Most of this map unit is woodland. A few areas have been cleared and are used for hay, corn, and orchards. An increasing acreage, mainly on Cheshire soils, is being used for community development.

This map unit has poor potential for community development. It is limited mainly by the bedrock outcrops and shallowness to bedrock. This map unit has poor potential for farming and for trees; woodland, nevertheless, may still be one of the best uses of this map unit.

9. Branford-Manchester

Nearly level to sloping, excessively drained and well drained, loamy and sandy soils; on glacial outwash plains and terraces

This map unit makes up about 6 percent of the county. It is mainly in the valleys throughout the Connecticut Valley Lowlands in the central part of the county. The landscape is mainly nearly level and gently sloping terraces dissected by a few streams.

Branford soils make up about 40 percent of this map unit. They are deep, well drained, loamy soils that are underlain by sand and gravel at a depth of about 24 inches. They are nearly level to sloping and occupy broader terraces of this landscape.

Manchester soils make up about 30 percent of this map unit. They are deep, excessively drained, coarse textured soils that formed in sand and gravel. They are nearly level to sloping and occupy terraces of narrow stream valleys.

Minor soils make up the remaining 30 percent of this map unit. They are mainly Ellington, Cheshire, Penwood, Rumney Variant, and Westbrook soils. The Ellington soil is moderately well drained and is in slight depressions on outwash terraces. Cheshire soils are deep and well drained and are on small glacial till uplands. Penwood soils are deep and excessively drained. They are on broader outwash plains. Rumney Variant soils are deep and poorly drained. These alluvial soils are on the flood plains adjacent to streams. Westbrook soils are organic soils in coves adjacent to Long Island Sound and are subject to daily tidal flooding.

Most of this map unit has been cleared and is used for hay, corn, vegetables, and orchards. An increasing acreage is used for community development or is idle. Steep areas and areas of poorly drained soils are mostly woodland.

This map unit has good potential for community development, farming, and trees. Manchester soils, however, are droughty.

10. Penwood-Manchester-Deerfield

Nearly level to sloping, excessively drained to moderately well drained, sandy soils; on broad outwash plains

This map unit (fig. 3) occupies about 9 percent of the county. It is mainly in the Quinnipiac River Valley of the Connecticut Valley Lowlands in the central part of the county. The landscape is mostly nearly level to sloping outwash plains dissected by a few streams.

Penwood soils make up about 45 percent of this map unit. They are deep, excessively drained, sandy soils. They are nearly level to gently sloping and occupy broad outwash plains on both sides of the Quinnipiac River.

Manchester soils make up about 10 percent of this map unit. They are deep, excessively drained, coarse textured soils that formed in sand and gravel. They are nearly level to sloping and occupy terrace breaks and the edges of broad outwash plains.

Deerfield soils make up about 10 percent of this map unit. They are deep, moderately well drained, sandy soils. They are in nearly level and slightly depressional areas on broad outwash plains.

Minor soils make up the remaining 35 percent of this map unit. They are mainly the Walpole, Rumney, Rumney Variant, Podunk Variant, and Westbrook soils. Walpole soils are deep, poorly drained, and sandy. They are in depressions on outwash plains and terraces. The Rumney, Rumney Variant, and Podunk Variant soils of this map unit are on the flood plains of the Quinnipiac River and its major tributaries. Westbrook soils are organic soils near the mouth of the Quinnipiac River and in small coves adjacent to Long Island Sound. Westbrook soils are subject to daily tidal flooding.

Most of this map unit has been cleared and is used for community development or is idle. A small acreage is in woodland.

This map unit has good potential for community development; however, onsite septic systems on these soils can pollute ground water. It has poor potential for farming and for trees because it is droughty.

Soil maps for detailed planning

The map units shown on the detailed soil maps at the back of this publication represent the kinds of soil in the survey area. They are described in this section. The descriptions together with the soil maps can be useful in determining the potential of a soil and in managing it for food and fiber production; in planning land use and developing soil resources; and in enhancing, protecting, and preserving the environment. More information for each map unit, or soil, is given in the section "Use and management of the soils."

Preceding the name of each map unit is the symbol that identifies the soil on the detailed soil maps. Each soil description includes general facts about the soil and a brief description of the soil profile. In each description, the principal hazards and limitations are indicated, and the management concerns and practices needed are discussed.

The map units on the detailed soil maps represent an area on the landscape made up mostly of the soil or soils for which the unit is named. Most of the delineations shown on the detailed soil map are phases of soil series.

Soils that have profiles that are almost alike make up a *soil series.* Except for allowable differences in texture of the surface layer or of the underlying substratum, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement in the profile. A soil series commonly is named for a town or geographic feature near the place where a soil of that series was first observed and mapped.

Soils of one series can differ in texture of the surface layer or in the underlying substratum and in slope, erosion, stoniness, salinity, wetness, or other characteristics that affect their use. On the basis of such differences, a soil series is divided into phases. The name of a *soil phase* commonly indicates a feature that affects use or management. For example, Ludlow silt loam, 0 to 3 percent slopes, is one of several phases within the Ludlow series.

Some map units are made up of two or more dominant kinds of soil. Such map units are called soil complexes and undifferentiated groups.

A *soil complex* consists of areas of two or more soils that are so intricately mixed or so small in size that they cannot be shown separately on the soil map. Each area includes some of each of the two or more dominant soils, and the pattern and proportion are somewhat similar in all areas. Holyoke-Cheshire complex, 15 to 35 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils that could be mapped individually but are mapped as one unit because there is little value in separating them. The pattern and proportion of the soils are not uniform. An area shown on the map has at least one of the dominant (named) soils or may have all of them. Adrian and Palms mucks is an undifferentiated group in this survey area.

Most map units include small, scattered areas of soils other than those that appear in the name of the map unit. Some of these soils have properties that differ substantially from those of the dominant soil or soils and thus could significantly affect use and management of the map unit. These soils are described in the description of each map unit. Some of the more unusual or strongly contrasting soils that are included are identified by a special symbol on the soil map.

Most mapped areas include places that have little or no soil material and support little or no vegetation. Such places are called *miscellaneous areas*; they are delineated on the soil map and given descriptive names. Quarries is an example. Some of these areas are too small to be delineated and are identified by a special symbol on the soil map.

The acreage and proportionate extent of each map unit are given in table 4, and additional information on properties, limitations, capabilities, and potentials for many soil uses is given for each kind of soil in other tables in this survey. (See "Summary of tables.") Many of the terms used in describing soils are defined in the Glossary.

Soil descriptions

AA—Adrian and Palms mucks. This undifferentiated group consists of organic soils in low depressions on outwash terraces and glacial till plains. The organic layer of these soils is 16 to 50 inches thick. Slopes are 0 to 3 percent but are dominantly less than 1 percent. The areas are mainly irregular or circular in shape and are mostly 3 to 80 acres in size.

The soils of this map unit were not separated in mapping because they react similarly to most uses and management. The composition of this unit is more variable than that of other map units in the survey area, but it has been controlled well enough to be interpreted for the expected use of the soils. This undifferentiated group consists of about 45 percent Adrian soils, 40 percent Palms soils and 15 percent other soils. The mapped areas are made up of either Adrian soils or Palms soils or both.

Typically, Adrian soils have an organic layer that is 33 inches thick; this layer consists of black muck over very dark grayish brown muck. The substratum, to a depth of 60 inches, is dominantly gray, loose sand. Typically, Palms soils have an organic layer that is 32 inches thick; this layer consists of black, very dark grayish brown, and dark brown muck. The substratum, to a depth of 60 inches, is dark gray, friable, gravelly silt loam.

Included with these soils in mapping are areas, up to 5 acres in size, of the very poorly drained Carlisle, Scarboro, Whitman, Saco, and Menlo soils. In a few areas

the soils are more acid than Adrian and Palms soils. Included areas make up 5 to 20 percent of this map unit.

Adrian soils have moderately rapid permeability. Palms soils have moderately rapid permeability in the organic layer and moderate permeability in the substratum. The soils in this unit have a high available water capacity. Runoff is very slow. These soils remain wet most of the year and are ponded for several weeks from fall through spring and after heavy rains in summer. Unless limed, the Adrian soils are very strongly acid through slightly acid. The Palms soils are medium acid to neutral in the organic layer and slightly acid to neutral in the substratum.

This map unit is mostly in woodland, or it has a marsh grass and sedge vegetation. A very small acreage has been cleared and drained and is used for vegetable farming. A few small areas have been filled and are in community developments.

The soils in this unit have poor potential for community development. They have a high water table at or near the surface most of the year and are subject to flooding or ponding. The organic layers have very low strength and stability. For most uses, the removal of the organic layers is not feasible. If fill is placed on top of the organic layers, the fill will settle over a period of several years. If the soils are drained, the organic material subsides and shrinks, and the surface of the soil is lowered. Excavating is difficult because the side slopes are unstable; they slump readily, and the excavations fill with water. Onsite septic disposal systems cannot feasibly be used on these soils.

This unit is poorly suited to cultivated crops because of wetness. Most areas are difficult to drain. Areas that are drained can be used to grow vegetables. If these soils are cultivated, the proper water table level should be maintained to minimize subsidence and loss of organic material. Cover crops are necessary to prevent wind erosion.

This unit is poorly suited to trees; however, most of the areas are in trees, mainly red maple, ash, and alder. Other common vegetation is sweet-pepperbrush, blueberry, viburnum, cinnamonfern, and royalfern. These soils have moderate productivity for woodland use, but they have severe limitations for using equipment because of wetness. Seedling mortality is high, and plant competition is severe. These soils have a severe windthrow hazard; the trees are shallow rooted because of the high water table. Trees to favor in existing woodlands are ash and maple.

The included Carlisle soils have potential for community development similar to that of the Adrian and Palms soils; however, the organic layers are deeper than 50 inches. The included Scarboro, Whitman, Saco, and Menlo soils are also poorly suited to community development because of a high water table at or near the surface most of the year. The Saco soils are also subject to frequent flooding. Capability subclass VIw; woodland suitability subclass 4w.

AfA—Agawam fine sandy loam, 0 to 3 percent slopes. This nearly level, well drained soil is on outwash terraces of stream valleys. Slopes are smooth and are up to 300 feet long. The areas are dominantly irregular in shape and are mostly 5 to 50 acres in size.

Typically, the surface layer of this soil is dark brown fine sandy loam 8 inches thick. The subsoil is dominantly dark brown and yellowish brown fine sandy loam 24 inches thick. The substratum, to a depth of 60 inches, is yellowish brown gravelly sand.

Included with this soil in mapping are small intermingled areas, generally less than 1 acre in size, of moderately well drained Ninigret soils, well drained Haven soils, and excessively drained Hinckley soils. In a few areas in the Quinnipiac River Valley the soils have a redder color in the substratum. Included areas make up 5 to 15 percent of this map unit.

Permeability is moderately rapid in the surface layer and subsoil and rapid in the substratum. The available water capacity is moderate. Runoff is slow. This soil tends to dry out and warm up fairly early in spring. It has a low shrink-swell potential. If it is not limed, the soil is strongly acid or medium acid.

This soil is used mainly for corn or hay. A few areas are used for vegetables or nursery stock. A rapidly increasing acreage is being used for community developments, particularly in the southern and more urban parts of the county. A small acreage is in woodland, and some areas are idle.

This soil has good potential for community development. It is easy to excavate; however, steep slopes of excavations are unstable. Waste disposal systems such as onsite septic systems will function satisfactorily with normal design and installation; however, the rapidly permeable substratum requires that caution be taken in some areas to prevent pollution of the ground water. This soil has good potential for landscaping.

This soil is well suited to cultivated crops. It is easy to maintain in good tilth. The hazard of erosion is slight, and controlling runoff and erosion is fairly easy.

This soil is well suited to trees; however, only a small acreage is in woodland. Productivity is moderate. Trees to favor in existing woodlots are eastern white pine, sugar maple, and northern red oak. Trees to plant are eastern white pine, white spruce, and Norway spruce.

The included Ninigret soils are not so well suited to community development. They have poor potential for onsite septic systems because of the seasonal high water table. Haven and Hinckley soils have good potential for community development. Hinckley soils have poor potential for landscaping because they are droughty. Capability class I; woodland suitability subclass 4o.

AfB—Agawam fine sandy loam, 3 to 8 percent slopes. This gently sloping, well drained soil is on outwash terraces of stream valleys. Slopes are smooth and up to 400 feet long. The areas are dominantly irregular in shape and are mostly 5 to 70 acres in size.

Typically, the surface layer of this soil is dark brown fine sandy loam 8 inches thick. The subsoil is dominantly dark brown and dark yellowish brown fine sandy loam 24 inches thick. The substratum, to a depth of 60 inches, is yellowish brown gravelly sand (fig. 4).

Included with this soil in mapping are small intermingled areas, generally less than 1 acre in size, of moderately well drained Ninigret soils, well drained Haven soils, and excessively drained Hinckley soils. In a few areas in the Quinnipiac River Valley, the soils have a redder color in the substratum. Included areas make up 5 to 15 percent of this map unit.

Permeability is moderately rapid in the surface layer and subsoil and rapid in the substratum. This soil has a moderate available water capacity. Runoff is medium. This soil tends to dry out and warm up fairly early in spring. It has a low shrink-swell potential. If it is not limed, the soil is strongly acid or medium acid.

This soil is mostly cropland, or it is idle. The commonly grown crops are corn or hay; a few areas are used for vegetables or nursery stock. A rapidly increasing acreage is being used for community developments, mainly in the southern and more urban parts of the county. A small acreage is in woodland.

This soil has good potential for community development. It is easy to excavate, but the steep slopes of the excavations are unstable. Waste disposal systems, such as onsite septic disposal systems, will function satisfactorily with normal design and installation; however, the rapidly permeable substratum requires that caution be taken in some areas to prevent pollution of ground water. This soil has good potential for landscaping. Conservation measures are needed during construction of community developments to prevent excessive runoff, erosion, and siltation.

This soil is well suited to cultivated crops. It is easy to maintain in good tilth. The hazard of erosion is moderate. Major concerns in managing this soil are controlling runoff and erosion and maintaining fertility, organic matter content, and tilth. If this soil is cultivated, minimum tillage, the use of cover crops, and including grasses and legumes in the cropping system are practices that help reduce runoff and control erosion.

This soil is well suited to trees; however, only a small acreage is in woodland. Productivity is moderate. Trees to favor in woodlots are eastern white pine, sugar maple, and northern red oak. Trees to plant are eastern white pine, white spruce, and Norway spruce.

The included Ninigret soil is not so well suited to community development as this Agawam soil. It has poor potential for onsite septic disposal systems because of the seasonal high water table. Haven and Hinckley soils have good potential for community development. Hinckley soils have poor potential for landscaping because they are droughty. Capability subclass IIe; woodland suitability subclass 4o.

AfC—Agawam fine sandy loam, 8 to 15 percent slopes. This sloping, well drained soil is on outwash terraces of stream valleys. Slopes are smooth and less than 300 feet long. The areas are dominantly irregular or long and narrow in shape and are mostly 5 to 25 acres in size.

Typically, the surface layer of this soil is dark brown fine sandy loam 8 inches thick. The subsoil is dominantly dark brown and dark yellowish brown fine sandy loam 20 inches thick. The substratum, to a depth of 60 inches, is yellowish brown gravelly sand.

Included with this soil in mapping are small intermingled areas, generally less than an acre in size, of well drained Haven and Charlton soils and excessively drained Hinckley soils. Included areas make up 5 to 20 percent of this map unit.

Permeability is moderately rapid in the surface layer and subsoil and rapid in the substratum. This soil has a moderate available water capacity. Runoff is rapid. This soil tends to dry out and warm up fairly early in spring. It has low shrink-swell potential. Unless limed, the soil is strongly acid or medium acid.

This soil is mostly cropland; it is used mainly for hay. Some areas are idle. A rapidly increasing acreage is being used for community developments, mainly in the southern and more urban parts of the county. A smaller acreage is in woodland or is used for pasture.

This soil has fair potential for community development. It is easy to excavate; however, steep slopes of excavations are unstable. Waste disposal systems such as onsite septic systems need careful design and installation to insure that effluent does not seep to the surface downslope. Because of the rapidly permeable substratum, caution is needed in some areas to prevent pollution of ground water. This soil has fair potential for landscaping; it is limited mainly by the steepness of the slopes. Rather intensive measures may be required to prevent excessive runoff, erosion, and siltation during construction of community developments.

This soil is not well suited to cultivated crops because of the steepness of slope. The erosion hazard is severe, and rather intensive conservation measures are needed to prevent excessive runoff and erosion. This soil should have a good vegetative cover most or all of the year.

This soil is well suited to growing trees. Productivity is moderate. Care is needed in laying out logging roads and trails to prevent excessive erosion. Trees to favor in woodlots are eastern white pine, sugar maple, and northern red oak. Trees to favor in woodlots are eastern white pine, sugar maple, and northern red oak. Trees to plant are eastern white pine, white spruce, and Norway spruce.

The included Haven, Charlton, and Hinckley soils have good potential for community development. Hinckley soils have poor potential for landscaping because they are droughty. Charlton soils have stones and boulders in the subsoil and substratum. Capability subclass IIIe; woodland suitability subclass 4o.

Ba—Beaches. This miscellaneous area consists of gravel and sand adjacent to the shore of Long Island Sound. Slopes range from 0 to 15 percent but are mostly less than 8 percent. The areas are long and narrow, generally less than 300 feet wide, and are mostly 3 to 75 acres in size. Most of these beaches are in the towns of Milford, West Haven, and Madison. Hammonassett State Park in Madison has the largest beach in the county.

Typically, the beaches consist of deep deposits of gravelly sand that derived mainly from gneiss, schist, and granite. From West Haven eastward to Branford, the areas also include sandstone, conglomerate, shale, and basalt. Beaches commonly have 20 to 35 percent coarse fragments, but the fragments range from 15 to 50 percent.

Included with this unit in mapping are small intermingled areas, generally less than an acre in size, of Westbrook soils and Udorthents, smoothed. There are rock outcrops in a few places. In a few small areas in Guilford and Madison, the beaches are underlain by organic tidal deposits at a depth of 3 to 4 feet.

Permeability is rapid or very rapid. The lower areas are inundated twice daily by the tide. The higher areas are subject to rather frequent inundation by storm tides. These beaches are nearly barren. A few of the higher areas have a sparse vegetation of salt-tolerant and drought-resistant grasses.

Beaches have poor potential for most uses except recreation. Most beaches are heavily used during the summer but get little or no use during the rest of the year. Most beaches are gravelly. Capability subclass and woodland suitability subclass not assigned.

BoA—Branford silt loam, 0 to 3 percent slopes. This nearly level, well drained soil is on broad outwash terraces and narrow stream valleys. Slopes are smooth and less than 200 feet long. The areas are dominantly irregular in shape and are mostly 5 to 60 acres in size.

Typically, the surface layer is dark reddish brown silt loam about 8 inches thick. The subsoil is reddish brown loam 16 inches thick. The substratum, described to a depth of 60 inches, is reddish brown gravelly sand.

Included with this soil in mapping are small intermingled areas, generally less than 1 acre in size, of moderately well drained Ellington soils, well drained Cheshire soils, and excessively drained Manchester soils. Also included are a few areas that have 40 to 48 inches of silt loam over the sand and gravel substratum, and a few small areas that have steeper slopes. Included areas make up 5 to 15 percent of this map unit.

Permeability is moderate or moderately rapid in the surface layer and subsoil and rapid or very rapid in the substratum. This soil has a moderate available water capacity. Runoff is slow. This soil tends to dry out and warm up fairly early in spring. It has a low shrink-swell potential. Unless limed, it is very strongly acid through medium acid.

This soil is mostly used for corn, hay, and vegetables. A significant and rapidly increasing acreage is being used for community development. A small acreage is idle, in woodland, or used for nursery stock and orchards.

This soil has good potential for community development. It is easy to excavate; however, steep slopes of excavations are unstable. Waste disposal systems such as onsite septic systems will function satisfactorily with normal design and installation; however, the very rapidly permeable substratum requires that care be taken in some areas to prevent pollution of the ground water.

This soil is well suited to cultivated crops. It is easy to maintain in good tilth. The hazard of erosion is slight; simple conservation measures are adequate to control runoff and erosion.

This soil is well suited to growing trees; however, only a small acreage is in woodland. Productivity is moderately high. Trees to favor in existing stands are eastern white pine and northern red oak. Trees to plant are eastern white pine.

The included Ellington soil is not so well suited to community development as the Branford soil. And it has poor potential for onsite septic systems because of a seasonal high water table. Cheshire and Manchester soils have good potential for community development. Manchester soils have poor potential for landscaping because they are droughty. Cheshire soils have stones and boulders in the subsoil and substratum. Capability class I; woodland suitability subclass 3o.

BoB—Branford silt loam, 3 to 8 percent slopes. This gently sloping, well drained soil is on broad outwash terraces and narrow stream valleys. Slopes are smooth and less than 300 feet long. The areas are dominantly irregular in shape and are mostly 5 to 80 acres in size.

Typically, the surface layer is dark reddish brown silt loam 8 inches thick. The subsoil is reddish brown silt loam 16 inches thick. The substratum, described to a depth of 60 inches, is reddish brown gravelly sand.

Included with this soil in mapping are small intermingled areas, generally less than 1 acre in size, of moderately well drained Ellington soils, well drained Cheshire soils, and excessively drained Manchester soils. Also included are a few areas that have 40 to 48 inches of silt loam over the sand and gravel substratum. Included areas make up 5 to 15 percent of this map unit.

Permeability is moderate or moderately rapid in the surface layer and subsoil and rapid or very rapid in the substratum. This soil has a moderate available water

capacity. Runoff is medium. This soil tends to dry out and warm up fairly early in spring. It has a low shrink-swell potential. Unless limed, the soil is very strongly acid through medium acid.

This soil is mostly cropland; in some areas it is idle. Crops commonly grown are corn, hay, and vegetables. A rapidly increasing acreage is used for community development. A small acreage is in woodland or is used to grow nursery stock and orchards.

This soil has good potential for community development. It is easy to excavate; however, steep slopes of excavations are unstable. Waste disposal systems such as onsite septic systems will function satisfactorily using normal design and installation; however, the very rapidly permeable substratum requires that care be taken in some areas to prevent pollution of the ground water. This soil has good potential for landscaping.

This soil is well suited to cultivated crops. It is easy to maintain in good tilth. The hazard of erosion is moderate. Controlling runoff and erosion and maintaining fertility, the organic matter content, and tilth are major concerns in farming. If this soil is cultivated, minimum tillage and use of cover crops and legumes in the cropping system are practices that help reduce runoff and control erosion.

This soil is well suited to growing trees; however, only a small acreage is in woodland. Productivity is moderately high. Trees to favor in existing stands are eastern white pine and northern red oak. Trees to plant are eastern white pine.

The included Ellington soil is not so well suited to community development as the Branford soil. It has poor potential for onsite septic systems because of a seasonally high water table. Cheshire and Manchester soils have good potential for community development. Manchester soils have poor potential for landscaping because they are droughty. Cheshire soils have stones and boulders in the subsoil and substratum. Capability subclass IIe; woodland suitability subclass 3o.

BoC—Branford silt loam, 8 to 15 percent slopes. This sloping, well drained soil is on outwash terraces of stream valleys. Slopes are mostly smooth and less than 300 feet long. The areas are dominantly irregular or long and narrow in shape. They are mostly 3 to 25 acres in size.

Typically, the surface layer is dark reddish brown silt loam 8 inches thick. The subsoil is reddish brown silt loam 14 inches thick. The substratum, to a depth of 60 inches, is reddish brown gravelly sand.

Included with this soil in mapping are small intermingled areas, generally less than 1 acre in size, of well drained Cheshire soils and excessively drained Manchester soils. Also included are a few small areas of steeper slopes. Included areas make up 5 to 20 percent of this map unit.

Permeability is moderate or moderately rapid in the surface layer and subsoil and rapid or very rapid in the substratum. This soil has moderate available water capacity. Runoff is rapid. This soil tends to dry out and warm up fairly early in spring. It has a low shrink-swell potential. Unless limed, this soil is very strongly acid through medium acid.

This soil is mainly used as cropland, or it is idle. Crops commonly grown are hay and corn. A few areas are in orchards and woodland. An increasing acreage is used for community development.

This soil has fair potential for community development. It is easy to excavate; however, steep slopes of excavations are unstable. Waste disposal systems, such as onsite septic systems, need careful design and installation to insure that effluent does not seep to the surface downslope from the leaching system. The very rapidly permeable substratum requires care in some areas to insure that the disposal system does not pollute the ground water. This soil has fair potential for landscaping. It is limited mainly by the steepness of slopes. Rather intensive conservation measures may be required to prevent excessive runoff, erosion, and siltation during periods of construction of community development.

This soil is not well suited to cultivated crops because of the steepness of slope. The erosion hazard is severe, and rather intensive conservation measures are needed to prevent excessive runoff and erosion. This soil should have good vegetative cover most or all of the year.

This soil is well suited to growing trees; however, only a small acreage is in woodland. Productivity is moderately high. Care is needed in laying out logging roads and trails to avoid causing excessive erosion. Trees to favor in existing stands are eastern white pine and northern red oak. Trees to plant are eastern white pine.

The included Manchester and Cheshire soils have similar potentials for community development. Manchester soils are poorly suited to landscaping because they are droughty. Capability subclass IIIe; woodland suitability subclass 3r.

BrC—Branford-Holyoke silt loams, 3 to 15 percent slopes. This soil complex consists of gently sloping and sloping, well drained soils on outwash terraces. The relief is affected by the underlying bedrock. Slopes are concave or convex and are mostly 50 to 300 feet long. The surface is uneven and is marked by outcrops of bedrock and a few small, wet depressions. The areas are dominantly irregular in shape and are mostly 5 to 100 acres in size. Most of this soil complex is in the towns of Branford and East Haven. Approximately 50 percent of this complex is made up of Branford silt loam, 30 percent is Holyoke rocky silt loam, and 20 percent is other soils.

The Branford and Holyoke soils are intermingled in such a complex and intricate pattern that they could not be separated in mapping. The typical Branford soil has a dark reddish brown silt loam surface layer 8 inches thick. The subsoil is reddish brown silt loam 16 inches thick.

The substratum, to a depth of 60 inches, is reddish brown gravelly sand. The typical Holyoke soil has a very dark brown silt loam surface layer 2 inches thick. The subsoil is dark reddish brown and reddish brown, friable silt loam 11 inches thick. The substratum is hard unweathered basalt bedrock.

Included with this complex in mapping are small areas, generally less than 1 acre in size, of moderately well drained Ellington soils, well drained Cheshire and Yalesville soils, and excessively drained Manchester soils. Also included are bedrock outcrops and a few small areas that have steeper slopes. Included areas make up 10 to 25 percent of this map unit.

The Branford soil has moderate or moderately rapid permeability in the surface layer and subsoil and rapid or very rapid permeability in the substratum. It has moderate available water capacity. Runoff is medium to rapid. This soil tends to dry out and warm up fairly early in spring. It has a low shrink-swell potential. Unless limed, this soil is very strongly acid through medium acid.

The Holyoke soil is moderately permeable above the bedrock. It has low available water capacity. Runoff is medium to rapid. It has a low shrink-swell potential. Bedrock outcrops are common.

Most areas of this complex are in community developments or in woodland. Other areas are idle, and only a few small areas are used for crops, mainly hay or vegetables.

This soil complex has fair to poor potential for community development. The Branford soil has good potential. The Holyoke soil has poor potential because of the shallowness to bedrock and the rock outcrops. Very careful planning, design, and installation are necessary to insure a well functioning septic system. The very rapidly permeable substratum of the Branford soil requires that care be taken to insure that the waste disposal system does not pollute the ground water. Installing water lines and sewers is costly because of the shallowness to bedrock. Rather intensive conservation measures may be required to prevent excessive runoff, erosion, and siltation during construction of community developments.

This soil complex is poorly suited to crops because of the numerous outcrops and the shallowness to bedrock of the Holyoke soil. Most of this complex is in an urban part of the county.

This complex is suited to trees. The Branford soil has moderately high productivity. The Holyoke soil has low productivity, a severe hazard of seedling mortality, and a moderate hazard of tree windthrow because of the shallow rooting depth. Machine planting is not practical in most areas because of the shallowness to bedrock, stoniness, and rock outcrops. Trees to favor in existing woodlots are eastern white pine and northern red oak. Trees to plant are eastern white pine.

The included Manchester and Cheshire soils have good potential for community development. The Ellington soils have poor potential for onsite septic systems because of the seasonal high water table, and the Yalesville soils have poor potential because of bedrock at a depth of 20 to 40 inches from the surface. Capability subclass VIs; woodland suitability subclass: Branford part 3r, Holyoke part 5d.

Ce—Carlisle muck. This nearly level, very poorly drained, deep organic soil is in low depressions on outwash terraces and glacial till plains. The organic layers range from 50 inches to more than 30 feet in depth. Slopes are 0 to 3 percent but are dominantly less than 1 percent. The areas are mainly irregular or circular in shape and are mostly 3 to 100 acres in size.

Typically, the surface layer is very dark brown muck 10 inches thick. The subsurface layer is dark reddish brown muck 19 inches thick. The bottom layer, described to a depth of 70 inches, is dark reddish brown and dark brown muck.

Included with this soil in mapping are small intermingled areas, generally less than 2 acres in size, of very poorly drained Adrian, Palms, Scarboro, Whitman, and Menlo soils. A few areas are more acid than others. Included areas make up 5 to 20 percent of this map unit.

This soil has moderately rapid permeability. It has a high available water capacity. Runoff is very slow. This soil remains wet most of the year and is ponded for several weeks from fall to spring and after heavy rains in summer. Unless limed, the soil ranges from medium acid through neutral.

This soil is mostly in trees, marsh grass, or sedge vegetation. A very small acreage has been cleared and drained and is used for vegetable farming. A few small areas have been filled and are in community developments.

This soil has poor potential for community development. It has a high water table most of the year and is subject to flooding or ponding. The organic layers have very low strength and stability. In many places, they are too deep to be feasibly removed. If this soil is drained, subsidence causes the organic material to shrink, thus lowering the surface of the soil. Excavating is difficult because the side slopes are very unstable and slough readily. Onsite septic systems are not feasible on this soil.

This soil is poorly suited to cultivated crops because of wetness. Most areas are difficult to drain. Areas that are drained can be used for vegetables. If this soil is cultivated, the water table level needs to be maintained to minimize subsidence. Cover crops are necessary to prevent wind erosion.

This soil is poorly suited to trees; however, in most areas it is wooded, and the main trees are red maple, ash, and alder. Other common vegetation is sweet-pepperbrush, blueberry, viburnum, cinnamonfern, and royalfern. This soil has moderate productivity for woodland use; however, it has severe limitations to the use of modern equipment. Seedling mortality is high. Plant com-

petition is severe. This soil has a severe windthrow hazard; the trees are shallow rooted because of the high water table. Trees to favor in existing woodlots are white ash, swamp white oak, and red maple. Trees to plant are northern white-cedar, Austrian pine, and eastern white pine.

The included Adrian and Palms soils have potentials similar to those of Carlisle muck; however, they have an organic layer that is less than 50 inches thick. The Scarboro, Whitman, and Menlo soils are poorly suited to community development because of the seasonal high water table. Capability subclass Vlw; woodland suitability subclass 4w.

CfB—Charlton fine sandy loam, 3 to 8 percent slopes. This gently sloping, well drained soil is on broad hilltops, ridge tops, and glacial till plains. Slopes are smooth and convex, and are up to 500 feet long. The areas are dominantly irregular in shape and are mostly 5 to 80 acres in size.

Typically, the surface layer is dark brown fine sandy loam 8 inches thick. The subsoil is yellowish brown and light olive brown fine sandy loam 18 inches thick. The substratum, to a depth of 60 inches, is grayish brown gravelly fine sandy loam that has a few firm lenses up to 4 inches thick.

Included with this soil in mapping are small intermingled areas, generally less than 1 acre in size, of moderately well drained Sutton and Woodbridge soils, well drained Paxton soils, and somewhat excessively drained Hollis soils. A few small areas have stones and boulders on the surface. In a few areas in West Haven and Guilford, the soils have a redder color in the substratum. Included areas make up 5 to 15 percent of this map unit.

Permeability is moderate or moderately rapid. This soil has a high available water capacity. Runoff is medium. This soil tends to dry out and warm up fairly early in spring. It has a low shrink-swell potential. Unless limed, this soil is very strongly acid through medium acid.

In most areas, this soil is used for hay and corn. In a few areas it is used for vegetables, nursery stock, and orchards. A significant and rapidly increasing acreage is in community development or is idle. The remaining acreage is woodland.

This soil has good potential for community development. It is fairly easy to excavate but commonly has stones and boulders. Waste disposal systems such as onsite septic systems generally function satisfactorily with normal design and installation. This soil has good potential for landscaping. During construction of community developments, conservation measures are needed to prevent excessive runoff, erosion, and siltation.

This soil is well suited to cultivated crops. Good tilth is easy to maintain. The hazard of erosion is moderate, and controlling runoff and erosion is a major concern. Maintaining good fertility and good organic matter content are also concerns. If this soil is cultivated, minimum tillage, use of cover crops, and including grasses and legumes in the cropping system can help reduce runoff and control erosion. Stones and boulders near the surface are an annoyance when using some tillage equipment.

This soil is well suited to trees. Most of this soil was once cropland, but a few areas have been left to grow back to woodland. Productivity is moderate. Machine planting is practical in open areas. Trees to favor in existing woodlots are eastern white pine, red maple, and northern red oak. Trees to plant in open areas are eastern white pine, European larch, white spruce, and eastern hemlock.

The included soils are not so well suited to community development. They have poor potential for onsite septic systems: the Paxton soils because of a slowly permeable substratum, the Sutton soils because of a seasonal high water table, the Hollis soils because of bedrock at a depth of 10 to 20 inches, and the Woodbridge soils because of a seasonal high water table at a depth of about 20 inches and a slowly permeable substratum. Capability subclass Ile; woodland suitability subclass 4o.

CfC—Charlton fine sandy loam, 8 to 15 percent slopes. This is a well drained soil on side slopes of hills and ridges and at the foot slopes of steep slopes. Slopes are smooth and convex and are generally less than 500 feet long. The areas are dominantly irregular or long and narrow in shape and are mostly 5 to 35 acres in size.

Typically, the surface layer is dark brown fine sandy loam 8 inches thick. The subsoil is yellowish brown and light olive brown fine sandy loam 18 inches thick. The substratum, to a depth of 60 inches, is grayish brown gravelly fine sandy loam that has a few firm lenses up to 4 inches thick.

Included with this soil in mapping are small intermingled areas, generally less than 1 acre in size, of well drained Paxton soils and somewhat excessively drained Hollis soils. A few small areas have stones and boulders on the surface. In a few areas in West Haven and Guilford, the soils have a redder color in the substratum. Included areas make up 5 to 15 percent of this map unit.

Permeability is moderate or moderately rapid. This soil has a high available water capacity. Runoff is medium to rapid. This soil tends to dry out and warm up fairly early in spring. It has a low shrink-swell potential. Unless limed, this soil is very strongly acid through medium acid.

In most areas this soil is used for hay and corn. A few areas are in orchards. A significant and rapidly increasing acreage is idle or in community developments; the remaining acreage is woodland.

This soil has fair potential for community development. It is limited mainly by the steepness of slopes. The steeper slopes cause additional expense in building roads, installing sewer and water lines, building homes, and designing and installing onsite septic systems. This soil is fairly easy to excavate but commonly has stones

and boulders. Waste disposal systems such as onsite septic systems need careful design and installation to insure that effluent does not seep to the surface downslope from the disposal system. Intensive conservation measures are needed to prevent excessive runoff, erosion, and siltation during construction.

This soil is suited to crops; however, it has a severe erosion hazard. Controlling runoff and erosion is a major management concern if this soil is cultivated. Minimum tillage, use of cover crops, stripcropping, and including grasses and legumes in the cropping system can help reduce runoff and erosion. Good tilth is easy to maintain.

This soil is well suited to trees. Most of this soil that is woodland was cropland at one time but was left to grow back to woodland. Productivity is moderate. Machine planting is practical in open areas. Trees to favor in existing woodlots are eastern white pine, red maple, and northern red oak. Trees to plant are eastern white pine, European larch, white spruce, and eastern hemlock.

The included Paxton and Hollis soils are not so well suited to community development. They are poorly suited for onsite septic systems: Paxton soils have a slowly permeable substratum, and Hollis soils have bedrock at a depth of 10 to 20 inches. Capability subclass IIIe; woodland suitability subclass 4o.

CfD—Charlton fine sandy loam, 15 to 25 percent slopes. This moderately steep, well drained soil is on the sides of hills and ridges and at the foot slopes of steep hills that have been highly influenced by the underlying bedrock. Slopes are smooth and convex and are mostly less than 500 feet long. The areas are dominantly long and narrow, oval, or irregularly shaped, and are mostly 5 to 30 acres in size.

Typically, the surface layer is dark brown fine sandy loam 8 inches thick. The subsoil is yellowish brown and light olive brown fine sandy loam 15 inches thick. The substratum, to a depth of 60 inches, is grayish brown, gravelly fine sandy loam that has a few firm lenses up to 4 inches thick.

Included with this soil in mapping are small intermingled areas, generally less than 1 acre in size, of well drained Paxton soils, excessively drained Hinckley soils, and somewhat excessively drained Hollis soils. In a few areas up to 15 acres in size, the soils are very stony. Included areas make up 5 to 15 percent of this map unit.

Permeability is moderate or moderately rapid. This soil has a high available water capacity. Runoff is rapid. This soil tends to dry out and warm up fairly early in spring. It has a low shrink-swell potential. Unless limed, the soil is very strongly acid through medium acid.

In most areas this soil was in crops or pasture at one time but is now idle or has been left to grow back to woodland. A small acreage is used for hay. A significant and increasing acreage is in community developments, particularly in the Naugatuck River Valley and in the southwestern part of the county. A few small areas are in orchards.

This soil has poor potential for community development. It is limited mainly by the steepness of slopes. The steepness of slopes causes additional expense in building homes, roads, and onsite septic systems and in installing water and sewer lines. This soil is fairly easy to excavate, but it commonly contains stones and boulders. Waste disposal systems such as onsite septic systems require very careful design and installation to insure that effluent does not seep to the surface downslope from the disposal system. Intensive conservation measures are needed to prevent excessive runoff, erosion, and siltation during construction of community developments.

This soil is poorly suited to cultivated crops because of steepness of slopes. It has a severe erosion hazard. A good vegetative cover should be maintained. Controlling runoff and erosion is the major concern in managing this soil for farming. The steepness of slopes is a hazard to the safe operation of most farm equipment. Safety precautions are necessary in operating equipment on this soil.

This soil is suited to trees. Productivity is moderate. Use of equipment is somewhat limited by the steepness of slope. Machine planting is practical in open areas but is somewhat hampered by slope. Trees to favor in existing woodlots are eastern white pine, northern red oak, and red maple. Trees to plant in open areas are eastern white pine, European larch, white spruce, and eastern hemlock.

The included Paxton and Hollis soils are more poorly suited to community development because Paxton soils have a slowly permeable substratum and Hollis soils have bedrock at a depth of 10 to 20 inches. The included Hinckley soils are underlain by sand and gravel, and steep cuts are unstable. The Hinckley soils are droughty. Capability subclass IVe; woodland suitability subclass 4r.

ChB—Charlton very stony fine sandy loam, 3 to 8 percent slopes. This gently sloping, well drained soil is on broad hilltops, ridgetops, and glacial till plains. Up to 3 percent of the surface is covered with stones and boulders. Slopes are smooth and convex and mainly less than 300 feet long. The areas are dominantly irregular or rectangular in shape and are mostly 5 to 50 acres in size.

Typically, the surface layer is dark brown fine sandy loam 6 inches thick. The subsoil is yellowish brown and light olive brown fine sandy loam 20 inches thick. The substratum, to a depth of 60 inches, is grayish brown gravelly fine sandy loam that has a few firm lenses up to 4 inches thick.

Included with this soil in mapping are small intermingled areas, generally less than 1 acre in size, of moderately well drained Sutton and Woodbridge soils, well drained Paxton soils, and somewhat excessively drained Hollis soils. In a few small areas, the soils do not have

stones and boulders on the surface. Included areas make up 5 to 15 percent of this map unit.

Permeability is moderate or moderately rapid. This soil has a high available water capacity. Runoff is medium. This soil tends to dry out and warm up fairly early in spring. It has a low shrink-swell potential. Unless limed, this soil is very strongly acid through medium acid.

In most areas this soil was cleared and used for crops or pasture at one time. Many of the stones and smaller boulders were removed, leaving only the larger stones and boulders in many places. Most areas of this soil have been left to grow back to woodland; some areas are idle. A small acreage is used for pasture and hay. A significant and rapidly increasing acreage is in community developments.

This soil has good potential for community development. It is fairly easy to excavate but commonly has stones and boulders below the surface as well as on the surface. Waste disposal systems such as onsite septic systems generally function satisfactorily with normal design and installation; however, surface stones and boulders may interfere with the installation. The surface stones and boulders interfere with landscaping. During periods of construction of community developments, conservation measures are needed to prevent excessive runoff, erosion, and siltation.

This soil is poorly suited to cultivated crops because of its stoniness. If the stones and boulders are removed, this soil is well suited to cultivated crops; however, stone removal is costly. This soil is suited to grasses and legumes, but stones and boulders interfere with harvesting equipment. This soil has a moderate erosion hazard, which is a major concern of management. If this soil is cultivated, it needs conservation measures to prevent excessive runoff, erosion, and siltation.

This soil is well suited to trees. Productivity is moderate. The stones and boulders slightly hinder the use of harvesting and planting equipment; however, machine planting is feasible in open areas. Trees to favor in existing woodlots are eastern white pine, northern red oak, and red maple. Trees to plant in open areas are eastern white pine, European larch, white spruce, and eastern hemlock.

The included soils are not so well suited to community development. They have poor potential for onsite septic systems: Paxton soils because of a slowly permeable substratum, Sutton soils because of a seasonal high water table, Woodbridge soils because of a seasonal high water table and a slowly permeable fragipan, and Hollis soils because of bedrock at a depth of 10 to 20 inches. Capability subclass VIs; woodland suitability subclass 4o.

ChC—Charlton very stony fine sandy loam, 8 to 15 percent slopes. This sloping, well drained soil is on side slopes of hills and ridges and at the foot slopes of steep slopes where the relief is affected by the underlying bedrock. Up to 3 percent of the surface is covered with stones and boulders. Slopes are smooth and convex and mostly less than 300 feet long. The areas are dominantly irregular, rectangular, or long and narrow in shape and are mostly 5 to 35 acres in size.

Typically, the surface layer is dark brown fine sandy loam 6 inches thick. The subsoil is yellowish brown and light olive brown fine sandy loam 20 inches thick. The substratum, to a depth of 60 inches, is grayish brown gravelly fine sandy loam that has a few firm lenses up to 4 inches thick.

Included with this soil in mapping are small intermingled areas, generally less than an acre in size, of well drained Paxton soils and somewhat excessively drained Hollis soils. A few small areas do not have stones and boulders on the surface. Included areas make up 5 to 15 percent of this map unit.

Permeability is moderate or moderately rapid. The available water capacity is high. Runoff is rapid. This soil tends to dry out and warm up fairly early in spring. It has low shrink-swell potential. Unless limed, it is very strongly acid through medium acid.

Most areas of this soil were once cleared and used for crops or pasture. Many stones and smaller boulders were removed leaving only the larger stones and boulders in many places. Most areas have reverted to woodland or are idle. A small acreage is used for pasture. A significant and rapidly increasing acreage is in community developments.

This soil has fair potential for community development. It is limited mainly by the steepness of slope and stoniness. This soil is fairly easy to excavate, but it commonly contains stones and boulders below the surface as well as on the surface. Waste disposal systems such as onsite septic systems need careful design and installation to insure that effluent does not seep to the surface downslope from the disposal system. Stones and boulders may interfere with the installation of the systems and with landscaping. Rather intensive conservation measures are needed to prevent excessive runoff, erosion, and siltation during periods of construction of community developments.

This soil is poorly suited to cultivated crops because of stoniness. Stone removal is costly. This soil is suited to grasses and legumes; however, the stones and boulders interfere with harvesting equipment. It has a severe erosion hazard, which is a major concern of management, and if the soil is cultivated it needs intensive conservation measures to control runoff and erosion.

This soil is suited to trees. Productivity is moderate. The stones and boulders somewhat hinder the use of harvesting and planting equipment; however, machine planting is feasible in open areas. Trees to favor in existing stands are eastern white pine, red maple, and northern red oak. Trees to plant in open areas are eastern white pine, European larch, white spruce, and eastern hemlock.

The included Paxton and Hollis soils have severe limitations for onsite septic systems; Paxton soils have a slowly permeable substratum and Hollis soils have bedrock at a depth of 10 to 20 inches. Capability subclass VIs; woodland suitability subclass 4o.

CnC—Charlton extremely stony fine sandy loam, 3 to 15 percent slopes. This gently sloping and sloping, well drained soil is on broad hilltops, ridgetops, glacial till plains, and at the foot of steep slopes where relief is affected by the underlying bedrock. About 3 to 25 percent of the surface is covered with stones and boulders. Slopes are mostly smooth and convex and mostly less than 400 feet long. The areas are dominantly irregular or rectangular in shape and are mostly 5 to 80 acres in size.

Typically, the surface layer is dark brown fine sandy loam 2 inches thick. The subsoil is dark brown and light olive brown fine sandy loam 24 inches thick. The substratum, described to a depth of 60 inches, is grayish brown, gravelly fine sandy loam with a few firm lenses up to 4 inches thick.

Included with this soil in mapping are small intermingled areas, generally less than an acre in size, of moderately well drained Sutton and Woodbridge soils, well drained Paxton soils, and somewhat excessively drained Hollis soils. A few small areas have fewer stones and boulders on the surface. The included areas make up 5 to 15 percent of this map unit.

This soil has moderate or moderately rapid permeability. It has high available water capacity. Runoff is medium to rapid. This soil tends to dry out and warm up fairly early in spring. It has low shrink-swell potential. Unless limed, it is very strongly acid through medium acid.

Most of this soil is in woodland. A small acreage is cleared and used for pasture; some areas are idle. A rapidly increasing acreage is being used for community developments.

This soil has fair potential for community development. It is limited mainly by stoniness and, in places, the steepness of the slope. Removal of stones and boulders is costly. Waste disposal systems such as onsite septic systems can function satisfactorily; however, stones and boulders hinder their installation. If a disposal system is placed on the steeper slopes, careful design and installation will be needed to prevent effluent from seeping to the surface downslope. Stoniness severely limits this soil for landscaping; however, large boulders are sometimes desired for their esthetic value and are left undisturbed. During periods of construction of community developments, conservation measures are needed to prevent excessive runoff, erosion, and siltation.

This soil is poorly suited to crops because of its stoniness. The stones and boulders are costly to remove, and the use of modern farming equipment is not feasible without their removal. The hazard of erosion is moderate to severe. Conservation measures such as permanent vegetation to control runoff and erosion are needed if this soil is cleared and farmed.

This soil is suited to trees. Productivity is moderate. The stones and boulders somewhat hinder the use of some harvesting equipment and make machine planting generally unfeasible. Trees to favor in existing woodlots are eastern white pine, northern red oak, and red maple. Trees to plant in open areas are eastern white pine, European larch, white spruce, and eastern hemlock.

The included soils are not so well suited to community development as this Charlton soil. They have poor potential for onsite septic systems: Paxton soils because of a slowly permeable substratum, Sutton soils because of a seasonal high water table, Woodbridge soils because of a seasonal high water table and a slowly permeable substratum, and Hollis soils because of bedrock at a depth of 10 to 20 inches. Capability subclass VIIs; woodland suitability subclass 4x.

CnD—Charlton extremely stony fine sandy loam, 15 to 35 percent slopes. This moderately steep and steep, well drained soil is on the sides of hills, ridges, and steep valleys where the relief is affected by the underlying bedrock. It has 3 to 25 percent of the surface covered with stones and boulders. Slopes are mostly smooth and convex and mainly 100 to 500 feet long. The areas are dominantly long and narrow or irregular in shape and are mostly 5 to 100 acres in size.

Typically, the surface layer is dark brown fine sandy loam 2 inches thick. The subsoil is dark brown, yellowish brown, and light olive brown fine sandy loam 21 inches thick. The substratum, described to a depth of 60 inches, is grayish brown gravelly fine sandy loam with a few firm lenses up to 4 inches thick.

Included with this soil in mapping are small intermingled areas, generally less than 1 acre in size, of well drained Paxton soils and somewhat excessively drained Hollis soils. A few small areas have less than 3 percent of the surface covered with stones and boulders. Included areas make up 5 to 20 percent of this map unit.

This soil has moderate or moderately rapid permeability. It has a high available water capacity. Runoff is rapid. This soil tends to dry out and warm up fairly early in spring, except for the northerly sloping areas, which take longer to warm up. This soil has a low shrink-swell potential. Unless limed, it is very strongly acid through medium acid.

In most areas this soil is used as woodland; only a small acreage has been cleared, and it is used for pasture or is idle. A small but increasing acreage is used for community development.

This soil has poor potential for community development because of the steepness of slopes and stoniness. Waste disposal systems such as onsite septic systems require very careful and often unusual design and installation to insure that they function satisfactorily and efflu-

ent does not seep to the surface downslope. This usually adds considerable expense to the cost of the disposal system. During periods of construction, intensive conservation measures are often needed to prevent excessive runoff and erosion. These measures may include temporary vegetation, diversions, and silt basins. Landscaping is difficult because of the stoniness and steepness of slopes; however, stones and boulders, especially large ones, are often desired for their esthetic value and are left undisturbed. This soil does provide sites for unusually designed houses.

This soil is poorly suited to crops because of its stoniness and the steepness of slopes. The stones and boulders are costly to remove, and the use of modern farming equipment is not feasible without their removal. This soil has a severe erosion hazard if cleared and cultivated.

This soil is suited to growing trees. Productivity is moderate. The use of harvesting equipment is somewhat limited by the stoniness and steepness of slopes. Machine planting is generally not feasible. Trees to favor in existing woodlots are eastern white pine, northern red oak, and red maple. Trees to plant in open areas are eastern white pine, European larch, white spruce, and eastern hemlock.

The included Paxton and Hollis soils are even less suitable for community development: Paxton soils have a slowly permeable substratum, and Hollis soils have bedrock at a depth of 10 to 20 inches. Capability subclass VIIs; woodland suitability subclass 4x.

CrC—Charlton-Hollis fine sandy loams, 3 to 15 percent slopes. This complex consists of gently sloping and sloping, well drained soils on uplands where the relief is affected by the underlying bedrock. Slopes are concave or convex and mostly 50 to 300 feet long. The areas have a rough surface with bedrock outcrops and a few narrow intermittent drainageways and small wet depressions. In most areas, 3 to 25 percent of the surface is covered with stones and boulders. The areas are mostly 5 to 125 acres in size. Approximately 45 percent of these areas is Charlton fine sandy loam, 30 percent is Hollis fine sandy loam, and about 25 percent is other soils.

The Charlton and Hollis soils are in such a complex and intermingled pattern that they could not be separated in mapping. The typical Charlton soil has a dark brown fine sandy loam surface layer 2 inches thick. The subsoil is dark brown, yellowish brown, and light olive brown fine sandy loam 24 inches thick. The substratum, to a depth of 60 inches, is grayish brown, gravelly fine sandy loam that has a few firm lenses up to 4 inches thick. The typical Hollis soil has a very dark brown fine sandy loam surface layer 3 inches thick. The subsoil is dark brown fine sandy loam 11 inches thick, and it overlies hard, unweathered schist bedrock.

Included with this complex in mapping are small areas, generally less than 1 acre in size, of moderately well drained Sutton soils, well drained Paxton and Agawam soils, and poorly drained Leicester soils. In a few areas the stones and boulders have been cleared. Also included are many small and intermingled areas where the bedrock is 20 to 40 inches from the surface. Included areas make up 5 to 20 percent of this map unit.

The Charlton soil has moderate or moderately rapid permeability. It has a high available water capacity. Runoff is medium to rapid. This soil has a low shrink-swell potential. The Hollis soil has moderate or moderately rapid permeability above the bedrock. It has a low available water capacity. Runoff is medium to rapid. Both soils are very strongly acid through medium acid, if they are not limed.

Most of this complex is in woodland. Cleared areas are mainly used for pasture or are idle. Only a few areas are used to grow hay. A significant and rapidly increasing acreage is being used for community development.

This complex has fair to poor potential for community development. The Charlton soil has fair potential for community development. It is limited mainly by the steepness of slopes and stoniness. The Hollis soil has poor potential for community development. It is limited mainly by the bedrock at a depth of 10 to 20 inches. Excavations are often difficult on this soil complex because of the shallowness to bedrock in many places. Very careful planning, site location, design, and installation are necessary to insure that onsite waste disposal systems function satisfactorily.

Many areas of this complex provide a scenic and picturesque setting for homesites. Outcrops, stones, and boulders are often left undisturbed for their esthetic value. In many places they provide a creative opportunity for the unusual design of homes or other structures.

During construction of community developments, conservation measures such as temporary vegetation and siltation basins are frequently needed to prevent excessive runoff, erosion, and siltation.

This soil complex is poorly suited to crops because of the shallowness to bedrock, rock outcrops, and stoniness that hinder the use of farming equipment. Areas cleared of stones and boulders can be used to grow hay; however, the Hollis part of the complex is droughty, and the rock outcrops generally hinder the use of harvesting equipment. Controlling runoff and erosion is a major concern of management, particularly on the Hollis soil, which is only 10 to 20 inches deep to bedrock.

This soil complex is suitable for growing trees. Most of this complex is presently in woodland. The Charlton soil has moderate productivity. The Hollis soil has low productivity because of a severe hazard of seedling mortality and a moderate hazard of tree windthrow caused by the shallow rooting zone above the bedrock. Machine planting is somewhat difficult but feasible in areas without stones and boulders; however, it is not feasible in

most areas because of the stoniness, rock outcrops, and shallowness to bedrock. Trees to favor in existing woodlots are eastern white pine, northern red oak, sugar maple, and red maple. Trees to plant are eastern white pine, white spruce, European larch, and eastern hemlock.

The included Sutton, Leicester, and Paxton soil have fair or poor potential for onsite septic systems: Sutton and Leicester soils because of a seasonal high water table, and Paxton soils because of a slowly permeable substratum. The included Agawam soils have good potential for onsite septic systems. The areas with bedrock at a depth of 20 to 40 inches have poor potential for onsite septic systems. Capability subclass VIIs; woodland suitability subclass: Charlton part 4x; Hollis part 5d.

CsB—Cheshire fine sandy loam, 3 to 8 percent slopes. This gently sloping, well drained soil is on broad hilltops and ridgetops. Slopes are smooth and convex. They are mostly less than 300 feet long. The areas are dominantly irregular in shape and are mostly 5 to 75 acres in size.

Typically, the surface layer is dark brown fine sandy loam 8 inches thick. The subsoil is 18 inches thick. It is reddish brown, friable fine sandy loam. The substratum, to a depth of 60 inches, is reddish brown, friable, gravelly sandy loam and has discontinuous firm lenses up to 2 inches thick.

Included with this soil in mapping are small intermingled areas, generally less than 1 acre in size, of moderately well drained Watchaug and Ludlow soils and well drained Wethersfield and Yalesville soils. In a few areas the substratum is gravelly loamy sand. Also included are areas where the surface layer is silt loam and a few areas, up to 5 acres in size, where slopes are less than 3 percent. Included areas make up 5 to 15 percent of this map unit.

This soil has moderate permeability. It has a high available water capacity. Runoff is medium. This soil tends to dry out and warm up fairly early in spring. It has a low shrink-swell potential. Unless limed, this soil is medium acid through very strongly acid.

Most of this soil is cleared and is being farmed, or it is idle. Only a small acreage is woodland. A significant and rapidly increasing acreage is being used for community development.

This soil has good potential for community development. It is fairly easy to excavate but commonly contains stones and boulders. Waste disposal systems, such as onsite septic systems, will function satisfactorily with normal design and installation. This soil has good potential for landscaping. During periods of construction of community developments, conservation measures are needed to prevent excessive runoff, erosion, and siltation.

This soil is well suited to cultivated crops. It is easy to maintain in good tilth. The hazard of erosion is moderate, and controlling runoff and erosion is a concern in managing this soil. Maintaining good fertility and the organic matter content are also concerns. If this soil is cultivated, minimum tillage, use of cover crops, and including grasses and legumes in the cropping system are practices that help to reduce runoff and control erosion. A few cobbles and stones are in the plow layer and are an annoyance with some tillage equipment.

This soil is well suited to growing trees, but only a small acreage is woodland. Productivity is moderate. Machine planting is practical in open areas. Trees to favor in existing woodlots are eastern white pine and northern red oak. Trees to plant are eastern white pine, white spruce, and eastern hemlock.

The included soils are not so well suited to community development. They have poor potential for onsite septic systems because Watchaug soils have a seasonal high water table, Ludlow soils have a seasonal high water table and a slowly or very slowly permeable substratum, Wethersfield soils have a slowly or very slowly permeable substratum, and Yalesville soils have bedrock at a depth of 20 to 40 inches. Capability subclass IIe; woodland suitability subclass 4o.

CsC—Cheshire fine sandy loam, 8 to 15 percent slopes. This sloping, well drained soil is on the side slopes of hills and ridges and on foot slopes of steep slopes where the relief is affected by the underlying bedrock. Slopes are smooth and convex and are mostly less than 300 feet long. The areas are dominantly irregular in shape. They are mostly 5 to 40 acres in size.

Typically, the surface layer of this soil is dark brown fine sandy loam 8 inches thick. The subsoil is reddish brown, friable fine sandy loam 18 inches thick. The substratum, described to a depth of 60 inches, is reddish brown, friable, gravelly sandy loam with discontinuous firm lenses up to 2 inches thick.

Included with this soil in mapping are small intermingled areas, generally less than an acre in size, of well drained Wethersfield and Yalesville soils and somewhat excessively drained Holyoke soils. In a few small areas, the substratum is gravelly loamy sand. Also included are areas where the surface layer is silt loam. Included areas make up 5 to 15 percent of this map unit.

This soil has moderate permeability. It has a high available water capacity. Runoff is rapid. This soil tends to dry out and warm up fairly early in spring. It has a low shrink-swell potential. Unless limed, this soil is very strongly acid through medium acid.

Most of this soil is cleared and is idle, or it is being farmed. A few areas are in fruit orchards and woodland. A significant and rapidly increasing acreage is being used for community development.

This soil has fair potential for community development. It is limited mainly by the steepness of slope. The steeper slopes cause additional expense in building roads, installing sewer and water lines, building homes, and

designing and installing onsite septic systems. This soil is fairly easy to excavate but commonly contains stones and boulders. Onsite septic systems require careful design and installation to insure that effluent from the disposal system will not seep to the surface downslope. Conservation measures, such as temporary vegetation and silt basins, should be used to prevent excessive runoff, erosion, and siltation during construction of community developments.

This soil is suited to cultivated crops, but erosion is a severe hazard. Controlling runoff and erosion is the major concern of management, along with maintaining fertility, good organic matter content, and good tilth. Good tilth is easy to maintain. If this soil is used as cropland, minimum tillage, use of cover crops, and including grasses and legumes in the cropping system are practices that help to reduce runoff and control erosion. A few cobbles and stones occur in the plow layer and are an annoyance with some tillage equipment.

This soil is well suited to growing trees, but only a small acreage is woodland. Productivity is moderate. Machine planting is practical in open areas. Trees to favor in existing woodlots are eastern white pine and northern red oak. Trees to plant are eastern white pine, white spruce, and eastern hemlock.

The included soils are not so well suited to community development as this Cheshire soil. They have poor potential for onsite septic systems: Wethersfield soils because of a slowly or very slowly permeable substratum, Yalesville soils because of bedrock at a depth of 20 to 40 inches, and Hollis soils because of bedrock at a depth of 10 to 20 inches. Capability subclass IIIe; woodland suitability subclass 4o.

CsD—Cheshire fine sandy loam, 15 to 25 percent slopes. This moderately steep, well drained soil is on the sides of hills and ridges. Slopes are smooth and convex and are mostly less than 300 feet long. The areas are dominantly long and narrow and are mostly 5 to 25 acres in size.

Typically, the surface layer of this soil is dark brown fine sandy loam 8 inches thick. The subsoil is reddish brown, friable fine sandy loam 16 inches thick. The substratum, to a depth of 60 inches, is reddish brown, friable, gravelly sandy loam with discontinuous firm lenses up to 2 inches thick.

Included with this soil in mapping are small intermingled areas, generally less than an acre in size, of well drained Wethersfield and Yalesville soils and somewhat excessively drained Holyoke soils. A few small areas have a gravelly loamy sand substratum. Also included are areas with a silt loam surface layer and a few areas, up to 10 acres in size, with up to 3 percent of the surface covered with stones and boulders. Included areas make up 5 to 15 percent of this map unit.

This soil has moderate permeability. It has a high available water capacity. Runoff is rapid. This soil dries out and warms up fairly early in spring. It has a low shrink swell potential. Unless limed, this soil is very strongly acid through medium acid.

Most of this soil has been cleared and is idle or used as cropland or pasture. A small acreage is in fruit orchards. A significant and increasing acreage is in community development.

This soil has poor potential for community development. It is limited mainly by the steepness of slopes. The slopes cause additional expense in building roads and houses, in installing sewer and water lines, and in designing and installing onsite septic systems. This soil is fairly easy to excavate but commonly contains stones and boulders. Waste disposal systems such as onsite septic systems require very careful design and installation to prevent the effluent from seeping to the surface downslope from the leaching field. The steepness of slopes limits the use of this soil for landscaping. During construction of community developments, conservation measures such as temporary vegetation, diversions, and silt basins are needed to control excessive runoff, erosion, and siltation.

This soil is poorly suited to cultivated crops because of the steepness of slopes. It has a severe erosion hazard. Controlling runoff and erosion is the major concern in managing this soil for farming. This soil should have a good vegetative cover all or most of the year. The steepness of slopes is a hazard to the safe operation of most farming equipment, and safety precautions must be exercised when operating equipment on this soil.

This soil is well suited to trees. Productivity is moderate. Use of equipment is somewhat limited by the steepness of slopes. Machine planting is practical in the open areas, although it is somewhat hampered by the steepness of slopes. Care needs to be taken in laying out logging roads and trails to prevent erosion. Trees to favor in existing stands are eastern white pine and northern red oak. Trees to plant in open areas are eastern white pine, white spruce, and eastern hemlock.

The included soils are less suited to onsite septic systems: Wethersfield soils because of a slowly or very slowly permeable substratum, Yalesville soils because of bedrock at a depth of 20 to 40 inches, and Holyoke soils because of bedrock at a depth of 10 to 20 inches. Capability subclass IVe; woodland suitability subclass 4r.

CtB—Cheshire very stony fine sandy loam, 3 to 8 percent slopes. This gently sloping, well drained soil is on broad hilltops and ridgetops. It has 0.1 to 3 percent of the surface covered with stones and boulders. Slopes are smooth and convex and are mostly less than 300 feet long. The areas are dominantly irregular in shape and are mostly 5 to 40 acres in size.

Typically, the surface layer of this soil is dark brown fine sandy loam 7 inches thick. The subsoil is 19 inches thick. It is reddish brown, friable fine sandy loam. The substratum, to a depth of 60 inches, is reddish brown,

friable, gravelly sandy loam and has discontinuous firm lenses up to 2 inches thick.

Included with this soil in mapping are small intermingled areas, generally less than an acre in size, of moderately well drained Watchaug and Ludlow soils and well drained Wethersfield and Yalesville soils. A few small areas have a gravelly loamy sand substratum. Also included are areas with a silt loam surface layer and a few areas, up to 5 acres in size, where slopes are less than 3 percent. Included areas make up 5 to 15 percent of this unit.

This soil has moderate permeability. It has a high available water capacity. Runoff is medium. This soil tends to dry out and warm up fairly early in the spring. It has a low shrink-swell potential. Unless limed, this soil is very strongly acid through medium acid.

Most of this soil was cleared and was used as cropland or pasture at one time. Many of the stones and smaller boulders were removed, leaving only the larger stones and boulders in many places. Most areas of this soil have reverted to woodland or are idle. A small acreage is used for pasture. A significant and rapidly increasing acreage is in community development.

This soil has good potential for community development. It is fairly easy to excavate; however, it contains stones and boulders below the surface as well as on the surface. Waste disposal systems such as onsite septic systems will function satisfactorily with normal design and installation; however, stones and boulders may interfere with the installation. Surface stoniness is a hindrance in landscaping; however, large boulders are sometimes left undisturbed for their esthetic value. During construction of community developments, conservation measures such as temporary vegetation and silt basins may be needed to control runoff, erosion, and siltation.

This soil is poorly suited to cultivated crops because of its stoniness. If the stones are removed, it is well suited to crops; however, stone removal can be very costly. This soil is suited to grass and legumes; however, the stones and boulders interfere with harvesting equipment. This soil has a moderate erosion hazard. If this soil is cultivated, runoff and erosion need to be controlled.

This soil is well suited to trees. Productivity is moderate. Machine planting is practical in open areas, but stones and boulders interfere with planting equipment. Trees to favor in existing stands are eastern white pine and northern red oak. Trees to plant are eastern white pine, white spruce, and eastern hemlock.

The included soils are less suited to community development. They have poor potential for onsite septic disposal systems—Watchaug soils because of a seasonal high water table, Ludlow soils because of a seasonal high water table and a slowly or very slowly permeable substratum, Wethersfield soils because of a slowly or very slowly permeable substratum, and Yalesville soils because of bedrock at a depth of 20 to 40 inches. Capability subclass VIs; woodland suitability subclass 4o.

CtC—Cheshire very stony fine sandy loam, 8 to 15 percent slopes. This sloping, well drained soil is on the side slopes of hills and ridges and on the foot slopes of steep slopes where the relief is affected by the underlying bedrock. Between 0.1 and 3 percent of the surface is covered with stones and boulders. Slopes are mostly smooth and convex and less than 300 feet long. The areas are dominantly irregular in shape and mostly 5 to 25 acres in size.

Typically, the surface layer of this soil is dark brown fine sandy loam 7 inches thick. The subsoil is reddish brown, friable fine sandy loam 19 inches thick. The substratum, described to a depth of 60 inches, is reddish brown, friable, gravelly sandy loam with discontinuous firm lenses up to 2 inches thick.

Included with this soil in mapping are small intermingled areas, generally less than 1 acre in size, of well drained Wethersfield and Yalesville soils and somewhat excessively drained Holyoke soils. In a few small areas, the substratum is gravelly loamy sand. Also included are areas where the surface layer is silt loam. Included areas make up 5 to 15 percent of this map unit.

This soil has moderate permeability. It has a high available water capacity. Runoff is rapid. This soil tends to dry out and warm up fairly early in spring. It has a low shrink-swell potential. Unless limed, this soil is very strongly acid through medium acid.

Most of this soil was cleared and used as cropland or pasture at one time. Many of the stones and smaller boulders were removed, leaving only the larger stones and boulders in many places. Most areas of this soil have reverted to woodland or are idle. A small acreage is used for pasture. A significant and rapidly increasing acreage is being used for community development.

This soil has fair potential for community development. It is limited mainly by the steepness of the slopes and stoniness. This soil is fairly easy to excavate but commonly contains stones and boulders below the surface as well as on the surface. Waste disposal systems such as onsite septic systems need careful design and installation to insure that the effluent does not seep to the surface downslope from the disposal system. Surface stoniness is a hindrance in landscaping; however, large boulders are sometimes left undisturbed for their esthetic value. During construction of community developments, conservation measures such as temporary vegetation, diversions, and silt basins may be needed to control excessive runoff, erosion, and siltation.

This soil is poorly suited to cultivated crops because of its stoniness. If the stones are removed, it is suited to crops, but stone removal may be very costly. This soil is suited to grasses and legumes; however, the stones and boulders interfere with harvesting equipment. This soil has a severe erosion hazard, which is a major concern

of management. If this soil is cultivated, intensive conservation measures are needed to control runoff and erosion.

This soil is suited to trees. Productivity is moderate. The stones and boulders somewhat hinder the use of harvesting and planting equipment; however, machine planting is feasible in open areas. Trees to favor in existing stands are eastern white pine and northern red oak. Trees to plant are eastern white pine, white spruce, and eastern hemlock.

The included soils are more poorly suited to community development. They have poor potential for onsite septic systems because Wethersfield soils have a slowly or very slowly permeable substratum, Yalesville soils have bedrock at a depth of 20 to 40 inches, and Holyoke soils have bedrock at a depth of 10 to 20 inches. Capability subclass VIs; woodland suitability subclass 4o.

CvC—Cheshire extremely stony fine sandy loam, 3 to 15 percent slopes. This gently sloping and sloping, well drained soil is on hilltops and side slopes of hills and ridges and on foot slopes of steep slopes where the relief is affected by the underlying bedrock. Between 3 and 25 percent of the surface is covered with stones and boulders. Slopes are mostly smooth and convex and are mainly less than 300 feet long. The areas are dominantly irregular in shape. They are mostly 5 to 80 acres in size.

Typically, the surface layer is very dark grayish brown fine sandy loam 3 inches thick. The subsoil is 23 inches thick. It is reddish brown, friable fine sandy loam. The substratum, described to a depth of 60 inches, is reddish brown, friable, gravelly sandy loam with a few discontinuous firm lenses up to 2 inches thick.

Included with this soil in mapping are small intermingled areas, generally less than 1 acre in size, of moderately well drained Watchaug and Ludlow soils and well drained Wethersfield and Yalesville soils. In a few small areas, the substratum is gravelly loamy sand. Also included are areas where the surface layer is silt loam, and a few areas, up to 5 acres in size, where slopes are less than 3 percent. Included areas make up 5 to 15 percent of this map unit.

This soil has moderate permeability. It has a high available water capacity. Runoff is medium to rapid. This soil dries out and warms up fairly early in spring. It has a low shrink-swell potential. Unless limed, this soil is very strongly acid through medium acid.

Most of this soil is in woodland. A small acreage is cleared and is idle or used for pasture. A significant and rapidly increasing acreage is being used for community developments.

This soil has fair potential for community development. It is limited mainly by its stoniness and, in places, the steepness of slope. Waste disposal systems, such as onsite septic systems, can function satisfactorily; however, the stones and boulders hinder their installation. If a septic system is placed on the steeper slopes, careful design and installation are required to prevent effluent from seeping to the surface downslope. During construction of community developments, conservation measures such as temporary vegetation, diversions, and siltation basins may be needed to control excessive runoff, erosion, and siltation. Stoniness severely limits this soil for landscaping; however, large boulders are sometimes desired for their esthetic value and are not removed.

This soil is poorly suited to farming. The stones and boulders, which are normally very costly to remove, severely hinder the use of farming equipment. This soil has a moderate to severe erosion hazard; conservation measures are needed to control runoff and erosion.

This soil is suited to trees. Productivity is moderate. The stones and boulders hinder the use of some equipment and make machine planting of trees unfeasible. Trees to favor in existing stands are eastern white pine and northern red oak. Trees to plant are eastern white pine, white spruce, and eastern hemlock.

The included soils are poorly suited to onsite septic systems: Watchaug soils because of a seasonal high water table, Ludlow soils because of a seasonal high water table and a slowly or very slowly permeable substratum, Wethersfield soils because of a slowly or very slowly permeable substratum, and Yalesville soils because of bedrock at a depth of 20 to 40 inches. Capability subclass VIIs; woodland suitability subclass 4x.

CyC—Cheshire-Holyoke complex, 3 to 15 percent slopes. This soil complex consists of gently sloping and sloping, well drained soils on uplands. The relief is affected by the underlying bedrock. Slopes are concave or convex and mostly 50 to 400 feet long. The areas have a rough surface with bedrock outcrops, a few small wet depressions, and narrow intermittent drainageways. The areas are mostly irregular in shape and are mostly 5 to 125 acres in size. Most areas have 0.1 to 25 percent of the surface covered with stones and boulders. Approximately 45 percent of this unit is Cheshire extremely stony fine sandy loam, 30 percent is Holyoke silt loam, and about 25 percent is other soils.

The Cheshire and Holyoke soils are in such a complex and intricate pattern that they could not be separated in mapping. The typical Cheshire soil has a very dark grayish brown fine sandy loam surface layer 3 inches thick. The subsoil is about 23 inches thick. It is reddish brown, friable fine sandy loam. The substratum, described to a depth of 60 inches, is reddish brown, friable, gravelly sandy loam with discontinuous firm lenses up to 2 inches thick. The typical Holyoke soil has a very dark brown silt loam surface layer about 2 inches thick. The subsoil is about 11 inches thick. It is dark reddish brown and reddish brown, friable silt loam. The substratum is hard unweathered basalt bedrock.

Included with this complex in mapping are small areas, generally less than an acre in size, of well drained Yales-

ville and Wethersfield soils, moderately well drained Watchaug soils, and poorly drained Wilbraham soils. In places the Yalesville soil makes up as much as 20 percent of this map unit. Bedrock outcrops in most areas. Also included are areas where the Cheshire soil has a silt loam surface layer. Included areas make up 10 to 25 percent of this soil complex.

The Cheshire soil has moderate permeability. It has a high available water capacity. The Holyoke soil has moderate permeability above the bedrock. It has a low available water capacity. Both soils have medium to rapid runoff and low shrink-swell potential. They are very strongly acid through medium acid, unless limed.

Most of this soil complex is wooded. Cleared areas are idle, are used for pasture, or are in orchards. A few areas are used to grow hay. A rapidly increasing acreage is being used for community development.

The Cheshire soil has fair potential for community development. It is limited mainly by the steepness of the slopes and stoniness. The Holyoke soil has poor potential for community development. It is limited mainly by bedrock at a depth of 10 to 20 inches. Excavations are difficult because of the shallowness to bedrock in many places. Very careful planning, site location, design, and installation are necessary to insure that an onsite waste disposal system functions well. Many areas of this complex provide a scenic and picturesque setting for houses. Outcrops, stones, and boulders are sometimes left undisturbed for their esthetic value. During construction of community developments, conservation measures such as temporary vegetation and silt basins are frequently needed to prevent excessive runoff, erosion, and siltation.

This soil complex is poorly suited to crops because of the shallowness to bedrock, rock outcrops, and stoniness that hinder the use of farming equipment. Areas cleared of stones and boulders can be used to grow hay. The Holyoke part of the complex is droughty, and the rock outcrops hinder harvesting equipment. Controlling runoff and erosion is a major concern of management, particularly on the Holyoke soil, which is only 10 to 20 inches deep to bedrock.

This soil complex is suited to trees. Most of this complex is presently in woodland and orchards (fig. 5). The Cheshire soil has moderate productivity. The Holyoke soil has low productivity because of a severe hazard of seedling mortality and a moderate hazard of tree windthrow due to the shallow root zone. Machine planting may be feasible with some difficulty in open areas that have no stones and boulders; however, it is not feasible in most areas because of the shallowness to bedrock, stoniness, and rock outcrops. Trees to favor are eastern white pine and northern red oak. Trees to plant are eastern white pine, white spruce, and eastern hemlock.

The included soils have poor potential for onsite septic systems: Yalesville soils because of bedrock at a depth of 20 to 40 inches, Wethersfield soils because of a slowly or very slowly permeable substratum, Watchaug soils because of a seasonal high water table, and Wilbraham soils because of a seasonal high water table and a slowly or very slowly permeable substratum. Capability subclass VIs; woodland suitability subclass: Cheshire part 4o; Holyoke part 5d.

De—Deerfield loamy fine sand. This nearly level, moderately well drained soil is in slight depressions on broad outwash terraces. This soil has smooth slopes with up to 3 percent gradient. The slopes are mostly less than 300 feet long. The areas are dominantly irregular in shape and are mostly 5 to 100 acres in size.

Typically, the surface layer is very dark grayish brown loamy fine sand 8 inches thick. The subsoil is 20 inches thick. It is dark yellowish brown and yellowish brown loamy sand, mottled in the lower 12 inches. The substratum, to a depth of 60 inches, is dark brown and brown, mottled fine sand.

Included with this soil in mapping are small intermingled areas, generally less than an acre in size, of excessively drained Penwood soils, moderately well drained Ninigret soils, and poorly drained Walpole soils. Included areas make up 5 to 15 percent of this map unit.

Permeability is very rapid. This soil has a low available water capacity. It is droughty in summer. Runoff is slow. This soil has a seasonal high water table about 20 inches from the surface from late in fall through mid-spring. Unless limed, it is very strongly acid through medium acid.

This soil is mostly in woodland, or it is idle. A few small areas are used to grow vegetables and nursery stock. A significant and rapidly increasing acreage is used for community development.

This soil has fair to poor potential for community development. It has a seasonal high water table at a depth of about 20 inches. It is easy to excavate; however, steep slopes of excavations are very unstable. It has poor potential for waste disposal systems, such as septic tank absorption fields, because of the seasonal high water table. Furthermore, the septic systems can pollute the ground water. Attention needs to be given to designing and constructing foundations and basements to insure a stable foundation and prevent wet basements.

Without irrigation, this soil is poorly suited to cultivated crops. It has a seasonal high water table at a depth of about 20 inches from fall until mid-spring; however, it is droughty and often requires irrigation during much of the growing season. With irrigation, it is well suited to crops such as vegetables. It is easy to work with planting and harvesting equipment, even shortly after heavy rains. Erosion is easy to control; however, this soil should have a cover crop during the winter to control erosion. It needs good management to maintain an acceptable organic-matter content and fertility level.

This soil is suited to trees. Productivity is moderate. It is well suited to machine planting of trees and to the use

of modern logging equipment. Trees to favor in existing woodlots are eastern white pine and northern red oak. Trees to plant are eastern white pine and European larch.

The Ninigret soils have a similar potential for community development to this Deerfield soil. The included Penwood soils are better suited. The Walpole soils are less suited because they are wetter and have a higher water table. Capability subclass IIIw; woodland suitability subclass 4s.

Du—Dumps. These are miscellaneous areas used for the disposal of trash. They are commonly called landfills or sanitary landfills. There are dumps throughout the county. Most are on outwash terraces; many are adjacent to streams. Most areas are 3 to 40 acres in size. The trash in the dumps is covered daily with about 6 inches of soil material. In some of the older dumps, the trash was burned and was not covered with soil material.

Included in mapping are small areas, generally less than 1 acre in size, of Westbrook soils and of Udorthents, smoothed. In a few small dumps there are bedrock outcrops. A few dumps along the larger streams are subject to flooding.

Dumps require onsite investigation and evaluation if considered for other uses. An important item to consider is the leachate produced within the dump—what it consists of, where it goes, and what effect it has. A few dumps have been successfully used as industrial sites. Capability subclass and woodland suitability subclass not assigned.

Eh—Ellington silt loam. This is a nearly level, moderately well drained soil in slight depressions on broad outwash terraces of narrow stream valleys. This soil has smooth slopes of 0 to 3 percent. Most slopes are less than 250 feet long. The areas dominantly are irregular in shape and 3 to 25 acres in size.

Typically, the surface layer is dark reddish brown silt loam 8 inches thick. The upper part of the subsoil is reddish brown silt loam 10 inches thick, and the lower part is mottled, reddish brown very fine sandy loam 8 inches thick. The substratum, to a depth of 60 inches, is dark reddish brown very gravelly sand.

Included with this soil in mapping are small intermingled areas, generally less than 1 acre in size, of the well drained Branford soils, the moderately well drained Scio soils, and the poorly drained Raypol and Raynham soils. In a few areas the soils have a fine sandy loam surface layer. The included soils make up 5 to 15 percent of this map unit.

Permeability is moderate in the surface layer and subsoil and rapid or very rapid in the substratum. This soil has a moderate available water capacity. Runoff is slow. This soil dries out and warms up slowly in spring. It has a low shrink-swell potential. Unless limed, it is medium acid or strongly acid.

This soil is mostly cropland used to grow hay, corn, and vegetables. A few areas are idle or are woodland. A small, but increasing acreage is used for community development.

This soil has fair to poor potential for community development. It has a seasonal high water table at a depth of about 20 inches. This soil is easy to excavate; however, the steep slopes of excavations are unstable. This soil has poor potential for waste disposal systems, such as septic tank absorption fields, because the water table is high from late in fall until mid or late spring. In addition, the septic system can pollute the ground water. Foundations and basements must be properly designed and constructed to insure a stable foundation and to prevent wet basements. During periods of construction, conservation measures are needed to prevent excessive runoff, erosion, and siltation.

This soil is well suited to crops. Wetness is the major limiting factor for best crop production. This soil has a seasonal high water table at a depth of about 20 inches from late in fall until middle or late spring and after prolonged rainy periods in summer. Drainage generally is needed to obtain the best production of commonly grown crops. Even if this soil is drained, it remains wet for several days after heavy rains, and the use of many kinds of farming equipment is restricted. Runoff and erosion are easy to control with simple conservation measures, such as planting cover crops during the winter months.

This soil is well suited to growing trees. It has no major limitations for growing or harvesting trees. Productivity is moderately high. Machine planting is feasible in open areas. Wetness may restrict the use of some equipment during the wetter parts of the year. Trees to favor in existing woodlots are eastern white pine and northern red oak. The trees to plant in open areas are eastern white pines.

The included Branford soils have greater potential for community development than this Ellington soil. The Scio soils have a potential similar to that of this Ellington soil. The Raypol and Raynham soils are less suited to community development because they are poorly drained and have a higher seasonal water table. Capability subclass IIw; woodland suitability subclass 3o.

HcA—Haven silt loam, 0 to 3 percent slopes. This nearly level, well drained soil is on outwash terraces of stream valleys. Slopes are smooth and mainly less than 200 feet long. The areas dominantly are irregular in shape and 5 to 40 acres in size.

Typically, the surface layer is very dark grayish brown silt loam 9 inches thick. The subsoil is strong brown and yellowish brown silt loam 22 inches thick. The substratum, to a depth of 60 inches, is yellowish brown stratified sand and gravel.

Included with this soil in mapping are small intermingled areas, generally less than 1 acre in size, of the well

drained Agawam soils and the moderately well drained Ninigret soils. The included soils make up 5 to 15 percent of this map unit.

Permeability is moderate in the surface layer and subsoil and very rapid in the substratum. This soil has a high available water capacity. Runoff is slow. This soil tends to dry out and warm up early in spring. It has a low shrink-swell potential. Unless the soil is limed, it is very strongly acid through medium acid.

The areas of this soil are mostly cropland, or they are idle. The crops commonly grown are corn and hay. A few small areas are used to grow vegetables. A small acreage is woodland. A significant and rapidly increasing acreage, mainly in the southwestern part of the county, is used for community development.

This soil has good potential for community development. It is easy to excavate; however, the steep slopes of excavations are unstable. Waste disposal systems, such as septic tank absorption fields, function satisfactorily with normal design and installation; however, the very rapidly permeable substratum requires that caution be taken not to pollute the ground water. This soil has good potential for landscaping.

This soil is well suited to cultivated crops. Good tilth is easy to maintain. The hazard of erosion is slight, and simple conservation measures are adequate to control runoff and erosion.

This soil is well suited to trees; however, only a small acreage is in woodland. Productivity is moderately high. Trees to favor in existing woodlots are eastern white pine, sugar maple, and northern red oak. Trees to plant in open areas are eastern white pine, European larch, and Norway spruce.

The included Agawam soils are similarly suited to community development. The included Ninigret soils are less suited and have poor potential for onsite septic systems because of a seasonal high water table at a depth of about 20 inches. Capability class I; woodland suitability subclass 3o.

HcB—Haven silt loam, 3 to 8 percent slopes. This gently sloping, well drained soil is on outwash terraces in stream valleys. Slopes are smooth, and most are less than 300 feet long. The areas dominantly are irregular in shape and 5 to 50 acres in size.

Typically, the surface layer is very dark grayish brown silt loam 9 inches thick. The subsoil is dominantly strong brown and yellowish brown silt loam 22 inches thick. The substratum, to a depth of 60 inches, is yellowish brown stratified sand and gravel.

Included with this soil in mapping are small intermingled areas, generally less than 1 acre in size, of the well drained Agawam soils and the moderately well drained Ninigret soils. Included areas make up 5 to 15 percent of this map unit.

Permeability is moderate in the surface layer and subsoil and very rapid in the substratum. This soil has a high available water capacity. Runoff is medium. This soil tends to dry out and warm up early in spring. It has a low shrink-swell potential. Unless the soil is limed, it is very strongly acid through medium acid.

Most areas of this soil are cropland, or they are idle. Crops commonly grown are hay and corn. A few small areas are used to grow vegetables. A small acreage is woodland. A rapidly increasing acreage, mainly in the southwestern part of the county, is used for community development.

This soil has good potential for community development. It is easy to excavate; however, the steep slopes of excavations are unstable. Waste disposal systems, such as septic tank absorption fields, will function satisfactorily with normal design and installation; however, because the substratum is very rapidly permeable, care must be taken not to pollute the ground water. This soil has good potential for landscaping. Conservation measures are needed to prevent excessive runoff, erosion, and siltation during periods of construction.

This soil is well suited to cultivated crops. Good tilth is easy to maintain. The hazard of erosion is moderate. Controlling runoff and erosion and maintaining fertility, good organic-matter content, and good tilth are major concerns if this soil is used for farming. If this soil is cultivated, the use of minimum tillage and cover crops and legumes in the cropping system helps to reduce runoff and control erosion.

This soil is well suited to growing trees; however, only a small acreage is in woodland. Productivity is moderately high. Trees to favor in existing woodlots are eastern white pine, sugar maple, and northern red oak. Trees to plant in open areas are eastern white pine, European larch, and Norway spruce.

The included Agawam soils are similarly suited to community development. The Ninigret soils are less suited and have poor potential for onsite septic systems because they have a seasonal high water table at a depth of about 20 inches. Capability subclass IIe; woodland suitability subclass 3o.

HkA—Hinckley gravelly sandy loam, 0 to 3 percent slopes. This nearly level, excessively drained soil is on outwash terraces of stream valleys. Slopes are smooth or complex and are mostly less than 200 feet long. The areas dominantly are irregular in shape and 5 to 30 acres in size.

Typically, the surface layer is dark brown gravelly sandy loam 8 inches thick. The upper part of the subsoil is strong brown gravelly sandy loam 5 inches thick, and the lower part is brown gravelly loamy sand 3 inches thick. The substratum, to a depth of 60 inches, is yellowish brown stratified sand and gravel.

Included with this soil in mapping are small intermingled areas, generally less than 1 acre in size, of well drained Agawam and Haven soils and moderately well drained Ninigret soils. A few areas are not so gravelly,

and in some areas the surface layer is gravelly loamy sand. Included areas make up 5 to 15 percent of this map unit.

Permeability is rapid in the surface layer and subsoil and very rapid in the substratum. This soil has a low available water capacity. Runoff is slow. This soil dries out and warms up rapidly in spring. It has a low shrink-swell potential. Unless the soil is limed, reaction ranges from medium acid through very strongly acid.

Most areas of this soil have been cleared and are used as cropland. Much of the acreage is now idle. A small acreage is woodland. A rapidly increasing acreage, mainly in the southern part of the county, is used for community development.

This soil has good potential for community development. It is easy to excavate; however, the steep slopes of excavations are unstable. The droughtiness of this soil is a major concern in landscaping. Irrigation or sprinkling is needed in summer. Waste disposal systems, such as septic tank absorption fields, will function satisfactorily with normal design and installation; however, the very rapid permeability requires that caution be taken to prevent the pollution of ground water. This soil has good potential for use as sites for commercial buildings. During periods of construction, runoff, erosion, and siltation are easy to control.

Unless irrigated, this soil has poor potential for most crops because it is droughty. Irrigation is needed to insure a productive crop. Good tilth is easy to maintain; however, the gravel content of this soil hinders the use of some farming equipment. Many areas can be used to grow hay or for pasture. Controlling runoff and erosion is not a major problem.

This soil is fairly well suited to trees. Productivity is low because the soil is droughty. Seedling mortality is severe because the soil lacks sufficient moisture to sustain the seedlings. Trees to favor in existing woodlots are eastern white pine, northern red oak, and sugar maple. Trees to plant in open areas are eastern white pine and European larch.

The included Agawam and Haven soils are similarly suited to community development. They are better suited to landscaping than this Hinckley soil because they are not droughty. The moderately well drained Ninigret soils have poor potential for onsite septic systems because of the seasonal high water table at a depth of about 20 inches. Capability subclass IIIs; woodland suitability subclass 5s.

HkB—Hinckley gravelly sandy loam, 3 to 8 percent slopes. This gently sloping, excessively drained soil is on outwash terraces of stream valleys. Slopes are smooth or complex and are mostly less than 200 feet long. The areas dominantly are irregular in shape and 3 to 45 acres in size.

Typically, the surface layer is dark brown gravelly sandy loam 8 inches thick. The upper part of the subsoil is strong brown gravelly sandy loam 5 inches thick, and the lower part is brown gravelly loamy sand 3 inches thick. The substratum, to a depth of 60 inches, is yellowish brown stratified sand and gravel.

Included with this soil in mapping are small intermingled areas, generally less than 1 acre in size, of the well drained Agawam and Haven soils and the moderately well drained Ninigret soils. In a few areas, the soils are not so gravelly. Included areas make up 5 to 15 percent of this map unit.

Permeability is rapid in the surface layer and subsoil and very rapid in the substratum. This soil has a low available water capacity. Runoff is medium. This soil dries out and warms up rapidly in spring. It has a low shrink-swell potential. Unless the soil is limed, the reaction ranges from medium acid through very strongly acid.

Most areas of this soil have been cleared and are used as cropland. Much of the acreage is now idle. A small acreage is woodland. A rapidly increasing acreage, mainly in the southern part of the county, is used for community development.

This soil has good potential for community development. It is easy to excavate; however, the steep slopes of excavations are unstable. The droughtiness of this soil is a major concern in landscaping. Irrigation or sprinkling is needed in summer. Waste disposal systems, such as septic tank absorption fields, will function satisfactorily with normal design and installation; however, the very rapid permeability requires that caution be taken to prevent the pollution of ground water. This soil has fair potential for use as sites for commercial buildings and is limited mainly by steep slopes. During periods of construction, simple conservation measures generally are adequate to prevent excessive runoff, erosion, and siltation.

This soil has poor potential for most crops because it is droughty. Irrigation is needed to insure a productive crop. Good tilth is easy to maintain; however, the gravel content hinders the use of some farming equipment. Good organic matter content needs to be maintained. Many areas can be used to grow hay and for pasture. Controlling runoff and erosion requires simple conservation measures.

This soil is fairly well suited to growing trees. Productivity is low because this soil is droughty. Seedling mortality is severe because the soil lacks sufficient moisture to sustain the seedlings. Trees to favor in existing woodlots are eastern white pine, northern red oak, and sugar maple. Trees to plant in open areas are eastern white pine and European larch.

The included Agawam and Haven soils are similarly suited to community development. They are better suited to landscaping than this Hinckley soil because they are not droughty. The included Ninigret soil has poor potential for septic tank absorption fields because it has a seasonal high water table at a depth of about 20 inches. Capability subclass IIIs; woodland suitability subclass 5s.

HkC—Hinckley gravelly sandy loam, 8 to 15 percent slopes. This sloping, excessively drained soil is on outwash terraces in stream valleys. It is mostly on the edges of terrace breaks and outwash terraces that are adjacent to the glacial till uplands. Slopes are mostly smooth and less than 250 feet long. The areas dominantly are irregular or long and narrow in shape and 3 to 25 acres in size.

Typically, the surface layer is dark brown gravelly sandy loam 8 inches thick. The upper part of the subsoil is strong brown gravelly sandy loam 5 inches thick, and the lower part is brown gravelly loamy sand 3 inches thick. The substratum, to a depth of 60 inches, is yellowish brown stratified sand and gravel.

Included with this soil in mapping are small intermingled areas, generally less than 1 acre in size, of the well drained Agawam and Haven soils. In a few areas, the soils are not so gravelly. Included areas make up 5 to 20 percent of this map unit.

Permeability is rapid in the surface layer and subsoil and very rapid in the substratum. This soil has a low available water capacity. Runoff is medium to rapid. This soil dries out and warms up rapidly in spring. It has a low shrink-swell potential. Unless the soil is limed, the reaction ranges from medium acid through very strongly acid.

Most areas of this soil are idle or are brushy woodland. A small acreage is used for pasture and for growing hay. An increasing acreage is used for community development.

This soil has fair potential for community development. It is limited mainly by steep slopes and droughtiness. It is easy to excavate; however, the steep slopes of excavations are unstable. The droughtiness of this soil is a major concern in landscaping. Irrigation or sprinkling is needed in summer. Waste disposal systems need to be carefully designed and installed so that effluent does not seep to the surface in areas downslope from the leaching system. Because of the very rapid permeability of this soil, precautions must be taken in some areas to insure that the disposal system does not pollute the ground water. Intensive conservation measures may be needed to prevent excessive runoff, erosion, and siltation during periods of construction.

This soil has poor potential for farming because it is sloping and droughty. The steepness of slopes make the installation of a satisfactory irrigation system difficult. Intensive conservation measures are needed to prevent excessive runoff and erosion if this soil is cultivated.

This soil is fairly well suited to trees. Productivity is low because this soil is droughty. Seedling mortality is severe because the soil lacks sufficient moisture to sustain the seedlings. Trees to favor in existing woodlots are eastern white pine, northern red oak, and sugar maple. Trees to plant in open areas are eastern white pine and European larch.

The included soils are similarly suited to community development. They are better suited to landscaping than the Hinckley soil because they are not droughty. Capability subclass IVs; woodland suitability subclass 5s.

HME—Hinckley and Manchester soils, 15 to 35 percent slopes. This map unit consists of moderately steep to very steep, excessively drained soils on outwash terraces. These soils are on breaks at the edge of terraces, along ravines, and in steep areas where the terraces join the glacial till uplands. Slopes are smooth and mostly less than 300 feet long. The areas are dominantly long and narrow in shape. They are mostly 3 to 50 acres in size. Approximately 65 percent of the total acreage is Hinckley soils and other similar soils and about 35 percent is Manchester soils and other similar soils.

The more extensive areas of Hinckley soils are in the eastern and western parts of the county. The redder colored Manchester soils are in the central part of the county. These soils were not separated in mapping because they react similarly to expected uses. The Hinckley soil typically has a dark brown gravelly sandy loam surface layer 3 inches thick. The upper part of the subsoil is strong brown gravelly sandy loam 10 inches thick, and the lower part is brown gravelly loamy sand 3 inches thick. The substratum, to a depth of 60 inches, is yellowish brown stratified sand and gravel. The Manchester soil has a reddish brown gravelly sandy loam surface layer 3 inches thick. The upper part of the subsoil is yellowish red gravelly sandy loam 7 inches thick, and the lower part is yellowish red gravelly loamy sand 6 inches thick. The substratum, to a depth of 60 inches, is reddish brown very gravelly sand.

Included with these soils in mapping are areas, up to 5 acres in size, of other soils. Included with the Hinckley soil are the well drained Agawam and Charlton soils and a few small bedrock outcrops. Also included are a few areas of soils that are not so gravelly. Included with the Manchester soil are the well drained Branford and Cheshire soils, the excessively drained Penwood soils, and a few small bedrock outcrops. Also included in this map unit are Podunk, Rumney, and Saco soils in small areas that are mainly less than 50 feet wide along streams in ravines and very narrow valleys. A few areas include slopes that are as much as 80 percent.

The Hinckley and Manchester soils have rapid permeability in the surface layer and subsoil and very rapid permeability in the substratum. Runoff is rapid. The available water capacity is low. Unless limed, these soils are medium acid through very strongly acid.

The soils of this unit are mostly wooded. A few areas are idle or are cleared and used for pasture. A small acreage is being used for community development.

The soils of this unit have poor potential for community development. They are limited mainly by the steep slopes. These soils are easy to excavate; however, the steep slopes of excavations are unstable. Waste disposal systems, such as septic tank absorption fields, need very careful and often unusual design and installation to

insure that effluent does not seep to the surface in areas downslope from the leaching system. Because of the very rapidly permeable substratum, care must be taken in some areas to prevent the pollution of ground water. The soils in this unit can provide sites for unusually designed buildings or houses. Intensive conservation measures generally are needed to prevent excessive runoff, erosion, and siltation during periods of construction.

The soils in this unit are poorly suited to crops because of the steep slopes. A few areas can be used to grow hay. The hazard of erosion is severe, and these soils should be kept in permanent vegetative cover.

These soils are not well suited to trees because they are droughty; however, this may be one of the best uses of these soils. Productivity is low. The droughtiness makes the establishment of tree seedlings difficult. The steep slopes hinder the use of most harvesting and planting equipment. Trees to favor in existing woodlots are eastern white pine and northern red oak. Trees to plant in open areas are eastern white pine and European larch.

The included Agawam, Charlton, Branford, Cheshire, and Penwood soils have similar limitations for community development because of their steep slopes. The included Podunk, Rumney, and Saco soils have poor potential for septic tank absorption fields because they have a high or seasonally high water table all or part of the year and are subject to flooding. Capability subclass VIIs; woodland suitability subclass 5s.

HpE—Hollis-Charlton fine sandy loams, 15 to 35 percent slopes. This map unit consists of moderately steep and steep, somewhat excessively drained and well drained soils on uplands where the relief is affected by the underlying bedrock. Slopes are concave or convex and are mostly 100 to 800 feet long. The areas have a rough surface and bedrock outcrops, a few narrow intermittent drainageways, and small wet depressions. In most areas, 3 to 25 percent of the surface is covered with stones and boulders. Approximately 40 percent of this map unit is Hollis fine sandy loam, 35 percent is Charlton extremely stony fine sandy loam, and about 25 percent is other soils and rock outcrops. The areas dominantly are long and narrow or irregular in shape and 3 to 200 acres in size.

The Hollis and Charlton soils are so intermingled on the landscape that they could not be separated in mapping. The typical Hollis soil has a very dark brown fine sandy loam surface layer 3 inches thick. The subsoil is dark brown fine sandy loam 11 inches thick, and it overlies hard, unweathered schist bedrock. The typical Charlton soil has a dark brown fine sandy loam surface layer 2 inches thick. The subsoil is dark brown, yellowish brown, and light olive brown fine sandy loam 24 inches thick. The substratum, to a depth of 60 inches, is grayish brown gravelly fine sandy loam that has a few firm lenses up to 4 inches thick.

Included in mapping are small areas, generally less than 1 acre in size, of well drained Paxton soils, the moderately well drained Sutton and Woodbridge soils, and soils that have bedrock at a depth of 20 to 40 inches. Most areas are 5 to 15 percent bedrock outcrops. Included soils make up 10 to 25 percent of this map unit.

The Hollis soil has moderate or moderately rapid permeability above the bedrock. It has a low available water capacity. Runoff is rapid. The Charlton soil has moderate or moderately rapid permeability. It has a high available water capacity. Runoff is rapid. Both soils have a low shrink-swell potential. Unless limed, they are medium acid through very strongly acid.

Most areas of this map unit are woodland. Only a small acreage has been cleared. Cleared areas are used for pasture or for orchards or are idle. An increasing acreage is used for community development.

This map unit has poor potential for community development. It is limited mainly by steep slopes, shallowness to bedrock, rock outcrops, and stoniness. Excavation is difficult because of the shallowness to bedrock in many places. Waste disposal systems, such as septic tank absorption fields, require very careful and often unusual design and installation to ensure that effluent does not seep to the surface in areas downslope from the leaching system. Sites of more than 2 acres are often needed to locate a sufficiently deep soil for installation of a septic tank absorption system. In addition, there is a hazard of effluent seeping into cracks in the bedrock and polluting the ground water, which is a source of drinking water in many places. Many of these areas provide a very scenic and picturesque setting for homes. This complex is severely limited for landscaping; however, rock outcrops, stones, and boulders are often desired for their esthetic value and are left undisturbed. Areas of this map unit provide an opportunity for the creative design of homes and other structures. During periods of construction, intensive conservation measures, such as the use of diversions, vegetative cover, mulching, and siltation basins, are frequently needed to prevent excessive runoff, erosion, and siltation.

This map unit is poorly suited to crops. The steep slopes, shallowness to bedrock, rock outcrops, and stoniness severely restrict the use of farming equipment. Even areas cleared of stones are poorly suited to crops. The Hollis soil is droughty.

This map unit is not well suited to trees; however, woodland may be one of its best uses. The Hollis soil has low productivity. Seedling mortality is severe because the Hollis soil does not have enough moisture during dry periods to sustain seedlings. Windthrow of the larger trees is common because the rooting depth is shallow. The Charlton soil has moderate productivity. Care must be taken in laying out logging roads and trails

to prevent erosion. The slopes restrict the use of many kinds of equipment. Machine planting of trees generally is not feasible. Trees to favor in existing woodlots are eastern white pine, northern red oak, and sugar maple. European larch, white spruce, eastern hemlock, and eastern white pine are suitable trees for planting on the Charlton soil.

The included soils have poor potential for septic tank absorption fields. The Paxton soils are limited by a slowly permeable substratum, and the Sutton soils by the seasonal high water table at a depth of about 20 inches. The potential is also poor where bedrock is at a depth of 20 to 40 inches. Capability subclass VIIs; woodland suitability subclass: Hollis soil 5d, Charlton soil 4x.

HrC—Hollis-Rock outcrop complex, 3 to 15 percent slopes. This map unit consists of gently sloping and sloping, somewhat excessively drained soils and Rock outcrop. Slopes are mainly convex and 100 to 400 feet long. The areas have a rough surface and bedrock outcrops, a few narrow intermittent drainageways, and small wet depressions. In most areas, the surface is 3 to 25 percent stones and boulders. Approximately 50 percent of this map unit is Hollis fine sandy loam, 30 percent is Rock outcrop, and 20 percent is other soils. The areas dominantly are irregular in shape and 5 to 60 acres in size.

The Hollis soil and Rock outcrop are so intermingled on the landscape that they could not be separated in mapping at the scale used. The typical Hollis soil has a very dark brown fine sandy loam surface layer 3 inches thick. The subsoil is dark brown fine sandy loam 11 inches thick and overlies hard unweathered schist bedrock. Rock outcrop is exposed hard bedrock.

Included with this unit in mapping are small areas, generally less than 1 acre in size, of well drained Charlton soils, moderately well drained Sutton soils, poorly drained Leicester soils, and very poorly drained Palms soils. Also included are small areas where bedrock is 20 to 40 inches from the surface. Included soils make up 10 to 25 percent of this map unit.

The Hollis soil has moderate or moderately rapid permeability above the bedrock. It has a low available water capacity. Runoff is medium to rapid. This soil has a low shrink-swell potential. Reaction is medium acid through very strongly acid. Rock outcrop has very rapid runoff.

Most areas of this complex are woodland. A few small areas are cleared and are idle or are used for pasture. A small acreage is used for community development.

This map unit has poor potential for community development. It is limited mainly by the shallowness to bedrock and the rock outcrops. Excavation is difficult and requires blasting in many places. Waste disposal systems, such as septic tank absorption fields, will not function without very careful and often unusual design and installation. The cost for such a system generally is much higher than usual. A site of 5 acres or more is commonly required to find a suitable location for an onsite septic system. This map unit provides a setting for the creative design of homes. During periods of construction, care is needed to prevent excessive runoff, erosion, and siltation.

This soil is not suited to crops because of the rock outcrops, shallowness to bedrock, and stoniness.

This map unit is poorly suited to trees because of the shallowness to bedrock and the rock outcrops; however, woodland may be one of its best uses. The Hollis soil has low productivity. Seedling mortality is severe because of droughtiness. Tree windthrow is a major problem because of the shallow rooting depth above bedrock. The rock outcrops and stoniness hinder the use of some kinds of harvesting equipment. Machine planting is not feasible. Trees to favor in existing woodlots are eastern white pine, northern red oak, and sugar maple. Trees to plant in open areas are eastern white pine.

The included Charlton soils are suited to community development. The other included soils have poor potential for septic tank absorption fields. The Leicester soils are limited by a high water table during part of the year, and the Palms soil by the 16 to 50 inches of organic material at the surface and by a high water table during most of the year. The potential for a septic system is also poor in areas where the bedrock is at a depth of 20 to 40 inches. Capability subclass VIIs; woodland suitability subclass: Hollis part 5d; Rock outcrop part not rated.

HSE—Hollis-Rock outcrop complex, 15 to 35 percent slopes. This map unit consists of moderately steep and steep, somewhat excessively drained soils on uplands and areas of Rock outcrop. The relief is affected by the underlying bedrock. Slopes mainly are convex and 100 to 700 feet long. The areas have bedrock outcrops, a few narrow intermittent drainageways, and small wet depressions. In most areas, the surface is 3 to 25 percent stones and boulders. Approximately 50 percent of this unit is Hollis fine sandy loam, about 30 percent is Rock outcrop, and 20 percent is other soils. The areas dominantly are long and narrow or irregular in shape. Many of the small areas are oval in shape. Most areas are 3 to 70 acres in size.

The Hollis soil and Rock outcrop are so intermingled on the landscape that they could not be separated in mapping at the scale used. The composition of this unit is more variable than that of other map units in the survey area, but the mapping and interpretations will not affect the expected use of this unit. The typical Hollis soil has a very dark brown fine sandy loam surface layer 3 inches thick. The subsoil is dark brown fine sandy loam 11 inches thick and overlies hard unweathered schist bedrock. Rock outcrop is exposed hard bedrock.

Included with this unit in mapping are areas up to 5 acres in size of the well drained Charlton soils, areas where bedrock is at a depth of 20 to 40 inches, and small areas of the moderately well drained Sutton soils.

A few areas have slopes ranging up to 100 percent. The included soils make up 10 to 20 percent of this map unit.

The Hollis soil has moderate or moderately rapid permeability above the bedrock. It has a low available water capacity. Runoff is rapid. This soil has a low shrink-swell potential. Reaction is medium acid through very strongly acid. Rock outcrop has very rapid runoff.

Nearly all areas of this unit are woodland. A few small cleared areas are idle or are used for pasture. Only a few small areas are used for community development.

This map unit has poor potential for community development. It is limited mainly by the shallowness to bedrock, steep slopes, and rock outcrops. Excavation is difficult and requires blasting in many places. This map unit has poor potential for waste disposal systems. Septic systems generally require very unusual design and installation, and there is a hazard that they may fail or that effluent may seep into cracks in the bedrock and pollute ground water, which is a source of drinking water in many places. Areas of this map unit provide sites for the creative design of homes. If this map unit is disturbed for construction, intensive conservation measures such as mulching, temporary vegetative cover, and siltation basins are generally needed to control excessive runoff, erosion, and siltation.

This map unit is not suited to crops because of the steep slopes, rock outcrops, stoniness, and shallowness to bedrock.

This map unit is poorly suited to trees because of the shallowness to bedrock and the rock outcrops; however, woodland may be its best use. The Hollis soil has low productivity. Seedling mortality is severe because of droughtiness. Tree windthrow is a major problem because of the shallow rooting depth. The rock outcrops, stoniness, and steep slopes hinder the use of many kinds of harvesting equipment. Machine planting of seedlings is not feasible. Trees to favor in existing woodlots are eastern white pine, northern red oak, and sugar maple. Trees to plant are eastern white pines.

The included soils also have poor potential for septic tank absorption fields. The Charlton soils are limited by the steep slopes, the Sutton soils by the seasonal high water table at a depth of about 20 inches, and soils in other areas are limited by bedrock at a depth of 20 to 40 inches. Capability subclass VIIs; woodland suitability subclass: Hollis part 5d; Rock outcrop part not rated.

HtC—Holyoke silt loam, rocky, 3 to 15 percent slopes. This is a gently sloping and sloping, somewhat excessively drained soil on hilltops on glacial till uplands where the relief is affected by the underlying bedrock. In most areas, the surface is as much as 15 percent stones and boulders. The surface can be as much as 10 percent rock outcrops, but in most places it is less than 5 percent. Slopes are smooth or undulating, and most are convex. Most slopes are 100 to 500 feet long. The areas dominantly are irregular or long and narrow in shape and 3 to 40 acres in size.

Typically, the surface layer is very dark grayish brown silt loam 2 inches thick (fig. 6). The subsoil is dark reddish brown and reddish brown silt loam 11 inches thick. The underlying bedrock is hard unweathered basalt.

Included with this soil in mapping are small intermingled areas, generally less than 1 acre in size, of well drained Yalesville and Cheshire soils and moderately well drained Watchaug soils. In some small areas, bedrock is at a depth of less than 10 inches. In a few areas, the surface layer and subsoil are fine sandy loam. Included soils make up 5 to 20 percent of the mapped areas.

The Holyoke soil is moderately permeable above bedrock. It has a low available water capacity. Runoff is medium to rapid. Unless limed, it is medium acid through very strongly acid.

Most areas of this soil are woodland. A few areas are cleared and are idle or are used to grow hay. Some small areas are used for pasture or are in orchards. An increasing acreage, mainly where public sewers are available, is used for community development.

This soil has poor potential for community development. It is limited mainly by the shallowness to bedrock and rock outcrops. This soil is difficult to excavate, and blasting is generally necessary. Because of the shallowness to bedrock, waste disposal systems such as septic tank absorption fields do not function satisfactorily unless very unusual and expensive design and installation procedures are used. Water and sewer lines are difficult and costly to install. Landscaping is limited by rock outcrops and stoniness; lawns, shrubs, and trees are affected by droughtiness. During periods of construction, conservation measures such as temporary vegetative cover, mulching, and siltation basins generally are needed to control excessive runoff, erosion, and siltation.

This soil is poorly suited to crops because it is droughty and has bedrock outcrops. It lacks sufficient moisture during most years for a good crop yield. In places, rock outcrops or bedrock that is at a depth of 10 inches interfere with tillage equipment. Intensive conservation measures may be needed to control runoff and erosion. Because this soil is shallow, erosion must be controlled to retain as much soil material as possible.

This soil is poorly suited to trees because of the shallowness to bedrock and rock outcrops (fig. 6). It has low productivity. Seedling mortality is severe because of droughtiness. Windthrow is common with larger trees because of the shallow rooting depth. Machine planting is feasible in some open areas, but it generally is difficult because of the shallowness to bedrock. Trees to favor in existing woodlots are eastern white pine and northern red oak. Trees to plant are eastern white pines.

The included Cheshire soils have a good potential for community development. The other included soils have poor potential for septic tank absorption fields. The

Yalesville soils are limited by bedrock at a depth of 20 to 40 inches, and the Watchaug soils by a seasonal high water table at a depth of about 20 inches. Capability subclass VIs; woodland suitability subclass 5d.

HuD—Holyoke-Cheshire complex, 15 to 35 percent slopes. This complex consists of moderately steep and steep, well drained and somewhat excessively drained soils on uplands where the relief is affected by the underlying bedrock. Slopes are concave or convex and most are 100 to 1,000 feet long. The areas have a rough surface with bedrock outcrops, a few narrow intermittent drainageways, and small wet depressions. In many areas, up to 15 percent of the surface is stones and boulders. Approximately 40 percent of this complex is Holyoke silt loam, 35 percent is Cheshire extremely stony fine sandy loam, and about 25 percent is other soils and rock outcrops. The areas of this complex dominantly are irregular or long and narrow in shape and 3 to 150 acres in size.

The Holyoke and Cheshire soils are so intermingled on the landscape that it was not practical to separate them in mapping. The typical Holyoke soil has a very dark grayish brown silt loam surface layer 2 inches thick. The subsoil is dark reddish brown and reddish brown silt loam 11 inches thick. The underlying bedrock is hard unweathered basalt. The typical Cheshire soil has a surface layer of very dark grayish brown fine sandy loam 3 inches thick. The subsoil is reddish brown fine sandy loam 23 inches thick. The substratum, to a depth of 60 inches, is reddish brown, very friable gravelly sandy loam that has discontinuous firm lenses up to 2 inches thick.

Included with this complex in mapping are small areas, generally less than 1 acre in size, of well drained Yalesville and Wethersfield soils, moderately well drained Watchaug soils, rock outcrops, and places where bedrock is at a depth of less than 10 inches. The Yalesville soils make up about 15 percent of this map unit. In a few areas the Cheshire soil has a silt loam surface layer, and in other areas the Holyoke soil has a fine sandy loam surface layer. Included areas make up 10 to 25 percent of this map unit.

The Holyoke soil has moderate permeability above the bedrock. It has a low available water capacity. Runoff is rapid. The Cheshire soil has moderate permeability. It has a high available water capacity. Runoff is rapid. The Holyoke and Cheshire soils have a low shrink-swell potential. Unless limed, they are medium acid through very strongly acid.

Most areas of this complex are woodland. Most cleared areas are idle or are overgrown with brush. A few small areas are used for pasture, orchards, or to grow hay. A small but increasing acreage, mainly in areas where public sewers are available, is used for community development.

This complex has poor potential for community development. It is limited mainly by steep slopes, shallowness to bedrock, and rock outcrops. Excavation is difficult in many places because of the shallowness to bedrock. Waste disposal systems, such as septic tank absorption fields, require very careful and often unusual design and installation to insure that effluent does not seep to the surface in areas downslope from the leaching system. Sites often need to be more than 2 acres in size in order to locate a soil that is deep enough for the installation of an onsite septic system. There is a hazard of effluent seeping into cracks in the bedrock and polluting the ground water, which is a source of drinking water in many places. Many of these areas provide a very scenic and picturesque setting for homes. Rock outcrops, stones, and boulders are often desired for their esthetic value and are left undisturbed. This complex provides an opportunity for the creative design of homes and other structures. During periods of construction, intensive conservation measures, such as diversions, vegetative cover, mulching, and sedimentation basins, are frequently needed to prevent excessive runoff, erosion, and siltation.

The soils of this complex are poorly suited to crops because of the bedrock outcrops, shallowness to bedrock, steep slopes, and stoniness. These features severely hinder the use of modern farming equipment.

This complex is not well suited to growing trees; however, woodland may be one of its best uses. The Holyoke soil has low productivity, and seedling survival is low because of droughtiness. Windthrow of the larger trees is common because of the shallow rooting depth. The Cheshire soils have moderate productivity. The steep slopes, stoniness, and rock outcrops hinder the use of some harvesting equipment. Machine planting of seedlings generally is not feasible. Trees to favor in existing woodlots are eastern white pine and northern red oak. The trees to plant in open areas are eastern white pine.

The included soils have poor potential for septic tank absorption fields. This is because Wethersfield soils have steep slopes, Watchaug soils have a seasonal high water table at a depth of about 20 inches, and Yalesville soils have bedrock at a depth of 20 to 40 inches. Capability subclass VIIs; woodland suitability subclass: Holyoke part 5d; Cheshire part 5r.

HyC—Holyoke-Rock outcrop complex, 3 to 15 percent slopes. This complex consists of gently sloping and sloping, somewhat excessively drained soils on uplands where the relief is affected by the underlying bedrock. Slopes mainly are convex and 100 to 500 feet long. The areas have a rough surface with bedrock outcrops, a few narrow intermittent drainageways, and small wet depressions. In most areas the surface is up to 15 percent stones and boulders. Approximately 45 percent of this complex is Holyoke silt loam, 30 percent is Rock outcrop, and 25 percent is other soils. The areas dominantly are irregular in shape and 3 to 65 acres in size.

The Holyoke soil and Rock outcrop are so intermingled on the landscape that they could not be separated in mapping at the scale used. The typical Holyoke soil has a very dark grayish brown silt loam surface layer 2 inches thick. The subsoil is dark reddish brown and reddish brown silt loam 11 inches thick. The underlying bedrock is hard unweathered basalt. Rock outcrop is exposed hard bedrock.

Included with this complex in mapping are small areas, generally less than 1 acre in size, of well drained Yalesville and Cheshire soils, poorly drained Wilbraham soils, very poorly drained Palms soils, and areas of soils that have bedrock at a depth of less than 10 inches. In a few areas, the surface layer is fine sandy loam. Included soils make up 10 to 20 percent of this map unit.

The Holyoke soil has moderate permeability above the bedrock. It has a low available water capacity. Runoff is rapid. Unless limed, this soil is medium acid through very strongly acid. Runoff is very rapid in areas of Rock outcrop.

Most areas of this complex are woodland. A few cleared areas are idle or are used for pasture. A small acreage, mainly in areas where there are public sewers, is used for community development.

This complex has poor potential for community development. It is limited mainly by the shallowness to bedrock and the rock outcrops. Excavation is difficult and requires blasting in many places. Waste disposal systems, such as septic tank absorption fields, do not function well without very careful and often unusual design and installation, and the cost generally is much higher than usual. An area of 5 acres or more generally is required to locate a site suitable for a septic system. This soil complex provides a good setting for creatively designed houses. During periods of construction, precautions need to be taken to prevent excessive runoff, erosion, and siltation.

This complex is not suited to use as cropland because of the rock outcrops, shallowness to bedrock, and stoniness.

This complex is poorly suited to trees because of the shallowness to bedrock and rock outcrops; however, woodland may be one of its best uses. The Holyoke soil has low productivity. There is a severe hazard of seedling mortality because of droughtiness. Tree windthrow is a major problem because of the shallow rooting depth. The rock outcrops and stoniness hinder the use of some harvesting equipment. Machine planting is not feasible in some places because of the rock outcrops and stoniness. Trees to favor in existing woodlots are eastern white pine and northern red oak. Trees to plant in open areas are eastern white pines.

The included Cheshire soils are well suited to community development. The other included soils have poor potential for septic tank absorption fields. The Yalesville soils are limited by bedrock at a depth of 20 to 40 inches, the Wilbraham soils by a high water table during much of the year, and the Palms soils by the 16 to 50 inches of organic material at the surface and by a high water table during most of the year. Capability subclass VIIs; woodland suitability subclass: Holyoke part 5d; Rock outcrop part not rated.

HZE—Holyoke-Rock outcrop complex, 15 to 35 percent slopes. This complex consists of moderately steep and steep, well drained to somewhat excessively drained soils on uplands. The relief is affected by the underlying bedrock. Slopes mainly are convex and 100 to 1,000 feet long. The areas have a rough surface with rock outcrops, a few narrow intermittent drainageways, and small wet depressions. In most areas the surface is as much as 15 percent stones and boulders. Approximately 50 percent of this unit is Holyoke silt loam, about 25 percent is Rock outcrop, and about 25 percent is other soils. The areas dominantly are irregular or long and narrow in shape and 3 to 100 acres in size.

The Holyoke soil and Rock outcrop are so intermingled on the landscape that it was not practical to separate them in mapping. The composition of this unit is more variable than that of other map units in the survey area, but the mapping and interpretations will not affect the expected use of this complex. The typical Holyoke soil has a very dark grayish brown silt loam surface layer 2 inches thick. The subsoil is dark reddish brown silt loam and reddish brown silt loam 11 inches thick. The underlying bedrock is hard unweathered basalt.

Included with this complex in mapping are areas, up to 5 acres in size, of the well drained Yalesville, Wethersfield, and Cheshire soils and areas where bedrock is at a depth of less than 10 inches. A few areas have a fine sandy loam surface layer. Also included are small areas of soils that are more gently sloping and a few areas, up to 20 acres in size, of soils that have slopes up to 100 percent. The included soils make up 10 to 20 percent of this map unit.

The Holyoke soil has moderate permeability above the bedrock. It has a low available water capacity. Runoff is rapid. Unless limed, this soil is medium acid through very strongly acid. Rock outcrop has very rapid runoff.

Most areas of this complex are woodland. A few cleared areas are idle or are used for pasture. A small acreage, mainly in areas where there are public sewers, is used for community development.

This complex has poor potential for community development. It is limited mainly by the shallowness to bedrock, steep slopes, and rock outcrops. Excavation is difficult in most places and requires blasting. This complex has poor potential for waste disposal systems such as septic tank absorption fields, and very careful and often unusual design and installation procedures generally are necessary. Even then, the system may fail or effluent may seep into the cracks in the bedrock and reach ground water, which is a source of drinking water in many places. If these areas are disturbed for construc-

tion, intensive conservation measures, such as mulching, temporary vegetative cover, and siltation basins, are needed to control excessive runoff, erosion, and siltation.

This complex is not suited to crops because of the rock outcrops, shallowness to bedrock, stoniness, and steep slopes.

This complex is poorly suited to growing trees because of the shallowness to bedrock and rock outcrops; however, woodland may be its best use. The Holyoke soil has low productivity. Seedling mortality is severe because of droughtiness. Tree windthrow is a major problem because the rooting depth is shallow. The rock outcrops, stoniness, and steep slopes hinder the use of many kinds of harvesting equipment. Machine planting of seedlings is not feasible. Trees to favor in existing woodlots are eastern white pine and northern red oak. Trees to plant in open areas are eastern white pines.

The included soils have poor potential for community development because of the steep slopes. In addition, the Yalesville soils have bedrock at a depth of 20 to 40 inches, and the Wethersfield soils have a slowly or very slowly permeable substratum. Capability subclass VIIs; woodland suitability subclass: Holyoke part 5d; Rock outcrop part not rated.

Lc—Leicester fine sandy loam. This is a nearly level, poorly drained soil in drainageways and depressions of glacial uplands. Slopes are 0 to 3 percent and are smooth and concave. They are generally 50 to 300 feet long. The areas dominantly are long and narrow or irregular in shape and 3 to 30 acres in size.

Typically, the surface layer is black fine sandy loam 6 inches thick. The subsoil is grayish brown, light grayish brown, and pale brown, mottled fine sandy loam 17 inches thick. The substratum, to a depth of 60 inches, is dark yellowish brown, mottled, friable gravelly fine sandy loam that has discontinuous firm lenses up to 4 inches thick.

Included with this soil in mapping are small intermingled areas, generally less than 1 acre in size, of moderately well drained Sutton and Woodbridge soils and poorly drained Ridgebury, Walpole, and Rumney soils. Also included are areas where the surface layer is silt loam and a few areas where up to 3 percent of the surface is covered with stones and boulders. Included areas make up 5 to 20 percent of this map unit.

This soil has a seasonal high water table at a depth of about 6 inches from late in fall until mid-spring. During the summer, the water table can drop to a depth of 5 feet or more. This soil has moderate or moderately rapid permeability. It has a high available water capacity. Runoff is slow. Good tilth is fairly easy to maintain. This soil dries out and warms up slowly in spring. It remains wet for several days after heavy rains in summer. It has a low shrink-swell potential. Unless limed, this soil is very strongly acid through medium acid.

Most areas of this soil are cleared and are idle or used for pasture. Only a small acreage is used as cropland. A small acreage has reverted to woodland. An increasing acreage is used for community development.

This soil has poor potential for community development. It is limited mainly by the high water table during much of the year. This soil is difficult to excavate because the high water table inundates the excavations. The steep slopes of excavations tend to slump when saturated. This soil has poor potential for building foundations and basements because footings are placed below the depth of the high water table. Waste disposal systems, such as septic tank absorption fields, do not function satisfactorily without very unusual and costly design and installation. Even then, septic systems are subject to a high rate of failure. Many areas are subject to ponding during the winter months. This soil has poor potential for landscaping because it is wet. Even during the summer this soil remains wet for several days after rains and is frequently soggy and difficult to mow. Many plants do not adapt to the wetness of this soil. During periods of construction, conservation measures are needed to prevent excessive siltation, runoff, and erosion.

This soil is fairly well suited to crops. Wetness is the major limitation for most crops, and drainage is needed for good crop production. Erosion is easy to control.

This soil is suited to trees. Productivity is moderate. The use of equipment is severely limited by wetness. Machine planting is practical in open areas. Seedling mortality is high, and tree windthrow is common because the rooting depth is restricted by the high water table. Trees to favor in existing woodlots are eastern white pine and northern red oak. Trees to plant are eastern white pine, white spruce, and northern white-cedar.

The included Sutton and Woodbridge soils are better suited to community development than the Leicester soil because they have a lower seasonal high water table. The Ridgebury, Walpole, and Rumney soils are similar to this Leicester soil in suitability for community development; however, the Rumney soils are subject to flooding. Capability subclass IIIw; woodland suitability subclass 4w.

LpA—Ludlow silt loam, 0 to 3 percent slopes. This is a nearly level, moderately well drained soil on the top of broad drumlins, in slight depressions, and near the base of drumlins and ridges of glacial uplands. Slopes are smooth and concave. They are generally 100 to 500 feet long. The areas dominantly are oval or irregular in shape and 5 to 40 acres in size.

Typically, the surface layer is dark brown silt loam 8 inches thick. The subsoil is dominantly reddish brown loam 22 inches thick that is mottled in the lower part. The substratum, to a depth of 60 inches, is mottled reddish brown, very firm fine sandy loam.

Included with this soil in mapping are small intermingled areas, generally less than 1 acre in size, of well drained Wethersfield and Yalesville soils, moderately well drained Watchaug soils, and poorly drained Wilbraham soils. Also included are a few areas of soils that have a loam or fine sandy loam surface layer. In a few small areas, the surface is as much as 3 percent stones and boulders. Included soils make up 5 to 15 percent of this map unit.

This soil has a seasonal high water table at a depth of about 20 inches from late in fall until mid-spring. It has moderate permeability in the surface layer and subsoil and slow or very slow permeability in the substratum. This soil has a moderate available water capacity. Runoff is slow. This soil dries out and warms up slowly in spring. It has a low shrink-swell potential. Unless limed, this soil is very strongly acid through medium acid in the surface layer and subsoil and very strongly acid through slightly acid in the substratum.

Most areas of this soil are cleared and are farmed or are idle. Only a small acreage is woodland. A significant and rapidly increasing acreage is used for community development.

This soil has fair potential for community development. It is fairly easy to excavate, but generally it has stones and boulders. The seasonal high water table frequently inundates excavations. The steep slopes of excavations are unstable when saturated and tend to slump. If houses with basements are built on this soil, the basements generally are below the depth of the seasonal high water table and are wet unless the soil is drained. A few areas are subject to ponding for short periods in winter. Waste disposal systems, such as septic tank absorption fields, generally do not function satisfactorily because of the seasonal high water table and the slowly or very slowly permeable substratum. Very careful and often costly design and installation are required to insure that septic systems function satisfactorily and are not flooded by the seasonal high water table. This soil is well suited to landscaping, but it can be wet and soggy for several days after heavy rains. During periods of construction, conservation measures are needed to prevent excessive runoff, erosion, and siltation.

This soil is well suited to cultivated crops. Good tilth is easy to maintain. Erosion is easy to control. Wetness is the major limiting factor for most crops, and crop production is best where the soils are drained and good fertility is maintained. A few cobbles and stones occur in the plow layer and are a hindrance to the use of some tillage equipment.

This soil is well suited to trees, but only a small acreage is woodland. Productivity is moderately high. Machine planting is practical in open areas. Trees to favor in existing woodlots are eastern white pine and northern red oak. Trees to plant are eastern white pine and European larch.

The included Wethersfield, Yalesville, and Watchaug soils also have fair potential for community development. The Wethersfield soils are limited mainly by the slowly or very slowly permeable substratum, the Yalesville soils by bedrock at a depth of 20 to 40 inches, and the Watchaug soils by a seasonal high water table at a depth of about 20 inches. The Wilbraham soils have poor potential for community development because they have a high water table at a depth of about 6 inches from fall until mid-spring and they have a slowly or very slowly permeable substratum. Capability subclass IIw; woodland suitability subclass 3o.

LpB—Ludlow silt loam, 3 to 8 percent slopes. This gently sloping, moderately well drained soil is on the top of broad drumlins, in slight depressions, and near the base of drumlins and ridges of glacial uplands. Slopes are smooth and concave. They generally are 100 to 500 feet long. The areas dominantly are irregular or long and narrow in shape and 5 to 40 acres in size.

Typically, the surface layer is dark brown silt loam 8 inches thick. The subsoil is dominantly reddish brown loam 22 inches thick that is mottled in the lower part. The substratum, to a depth of 60 inches, is mottled reddish brown, very firm fine sandy loam.

Included with this soil in mapping are small intermingled areas, generally less than 1 acre in size, of well drained Wethersfield and Yalesville soils, moderately well drained Watchaug soils, and poorly drained Wilbraham soils. Also included are a few areas where the surface layer is loam or fine sandy loam. In a few areas the surface is as much as 3 percent stones and boulders. Included areas make up 5 to 15 percent of this map unit.

This soil has a seasonal high water table at a depth of about 20 inches from late in fall until mid-spring. Permeability is moderate in the surface layer and subsoil and is slow or very slow in the substratum. The available water capacity is moderate. Runoff is medium. This soil dries out and warms up slowly in spring. It has a low shrink-swell potential. Unless limed, this soil is very strongly acid through medium acid in the surface layer and subsoil and very strongly acid through slightly acid in the substratum.

Most areas of this soil are cleared and are farmed or are idle. Only a small acreage is woodland. A significant and rapidly increasing acreage is being used for community development.

This soil has fair potential for community development. It is fairly easy to excavate but generally has stones and boulders. The seasonal high water table frequently inundates excavations. The steep slopes of excavations are unstable when saturated and tend to slump. If homes with basements are built on this soil, the basements generally are below the depth of the seasonal high water table and are wet unless the soil is drained. Waste disposal systems, such as septic tank absorption fields, generally do not function satisfactorily because of the

seasonal high water table and the slowly or very slowly permeable substratum. Very careful and often costly design and installation are required to insure that septic systems function satisfactorily and are not flooded by the seasonal high water table. This soil is well suited to landscaping but can be wet and soggy for several days after heavy rains. During periods of construction, conservation measures are needed to prevent excessive runoff, erosion, and siltation.

This soil is well suited to cultivated crops. Good tilth is easy to maintain. Wetness is the major limitation for most crops, and drainage is needed for best crop production. The hazard of erosion is moderate; runoff and erosion need to be controlled. If this soil is cultivated, the use of minimum tillage and the use of cover crops and grasses and legumes in the cropping system help to reduce runoff and control erosion. A few cobbles and stones occur in the plow layer and interfere with the use of some tillage equipment.

This soil is well suited to trees, but only a small acreage is woodland. Productivity is moderately high. Machine planting is practical in open areas. Trees to favor in existing woodlots are eastern white pine and northern red oak. Trees to plant are eastern white pine and European larch.

The included Wethersfield, Yalesville, and Watchaug soils also have fair potential for community development. The Wethersfield soils are limited mainly by the slowly or very slowly permeable substratum, the Yalesville soils by bedrock at a depth of 20 to 40 inches, and the Watchaug soils by a seasonal high water table at a depth of about 20 inches. The Wilbraham soils have poor potential because of a high water table at a depth of about 6 inches from late in fall until mid-spring and a slowly or very slowly permeable substratum. Capability subclass IIw; woodland suitability subclass 3o.

LuB—Ludlow very stony silt loam, 3 to 8 percent slopes. This gently sloping, moderately well drained soil is on the top of drumlins, in slight depressions, and near the base of drumlins and ridges of glacial uplands. In places, as much as 3 percent of the surface is covered with stones and boulders. Slopes are smooth and concave. They generally are 100 to 500 feet long. The areas dominantly are irregular or rectangular in shape and 5 to 30 acres in size.

Typically, the surface layer is dark brown silt loam 6 inches thick. The subsoil is dominantly reddish brown loam 24 inches thick and is mottled in the lower part. The substratum, to a depth of 60 inches, is mottled reddish brown, very firm fine sandy loam.

Included with this soil in mapping are small intermingled areas, generally less than 1 acre in size, of well drained Wethersfield and Yalesville soils, moderately well drained Watchaug soils, and poorly drained Wilbraham soils. In a few small areas there are no stones and boulders on the surface. In a few areas the surface layer is loam or fine sandy loam. Included soils make up 5 to 15 percent of this map unit.

This soil has a seasonal high water table at a depth of about 20 inches from late in fall until mid-spring. Permeability is moderate in the surface layer and subsoil and slow or very slow in the substratum. This soil has a moderate available water capacity. Runoff is medium. This soil dries out and warms up slowly in spring. It has a low shrink-swell potential. Unless limed, this soil is very strongly acid through medium acid in the surface layer and subsoil and very strongly acid through slightly acid in the substratum.

Most areas of this soil have been cleared and were used at one time for crops or pasture. Many of the stones and smaller boulders have been removed, and only the larger ones remain. Most areas of this soil have reverted to woodland or are idle. A small acreage is used for pasture, and a few areas are used to grow hay. A significant and rapidly increasing acreage is used for community development.

This soil has fair potential for community development. The stones and boulders on the surface interfere with landscaping. This soil is fairly easy to excavate, but the stones and boulders on the surface and below the surface are a hindrance. The seasonal high water table frequently inundates excavations. The steep slopes of excavations are unstable when saturated and tend to slump. If homes with basements are built on this soil, the basements generally are below the depth of the seasonal high water table and are wet unless the soil is drained. Waste disposal systems, such as septic tank absorption fields, generally do not function satisfactorily because of the seasonal high water table and the slowly or very slowly permeable substratum. Very careful and often costly design and installation are required to insure that septic systems function satisfactorily and are not flooded by the seasonal high water table. During periods of construction, conservation measures are needed to prevent excessive runoff, erosion, and siltation.

This soil is poorly suited to cultivated crops because of its stoniness. If the stones and boulders are removed, it is well suited to cultivated crops; however, stone removal is costly. This soil is suited to growing grasses and legumes, but the stones and boulders interfere with harvesting equipment. Wetness is a limitation on this soil, and drainage is needed for best crop production. Erosion is a moderate hazard. If the soil is cultivated, conservation measures are needed to prevent excessive runoff and erosion.

This soil is well suited to growing trees. Productivity is moderately high. The stones and boulders are a slight hindrance to the use of harvesting and planting equipment; however, machine planting is feasible in open areas. Trees to favor in existing woodlots are eastern white pine and northern red oak. Trees to plant are eastern white pine and European larch.

The included Wethersfield, Yalesville, and Watchaug soils also have fair potential for community development. The Wethersfield soils are limited mainly by the slowly or very slowly permeable substratum, the Yalesville soils by bedrock at a depth of 20 to 40 inches, and the Watchaug soils by a seasonal high water table at a depth of about 20 inches. The Wilbraham soils have poor potential because they have a high water table at a depth of about 6 inches from fall until mid-spring, and they have a slowly or very slowly permeable substratum. Capability subclass VIs; woodland suitability subclass 3o.

LvC—Ludlow extremely stony silt loam, 3 to 15 percent slopes. This is a gently sloping and sloping, moderately well drained soil on the top of drumlins, in slight depressions, and near the base of drumlins and ridges of glacial uplands. The surface is 3 to 25 percent stones and boulders. Slopes mainly are smooth and concave and are 100 to 500 feet long. The areas dominantly are irregular or rectangular in shape and are 5 to 40 acres in size.

Typically, the surface layer is very dark brown silt loam 3 inches thick. The subsoil is dominantly reddish brown loam 27 inches thick and is mottled in the lower part. The substratum, to a depth of 60 inches, is mottled, reddish brown, very firm fine sandy loam.

Included with this soil in mapping are small intermingled areas, generally less than 1 acre in size, of well drained Wethersfield and Yalesville soils, moderately well drained Watchaug soils, and poorly drained Wilbraham soils. In a few small areas, there are fewer stones and boulders on the surface. In a few areas, the surface layer is loam or fine sandy loam. The included soils make up 5 to 15 percent of this map unit.

This soil has a seasonal high water table at a depth of about 20 inches from late in fall until mid-spring. Permeability is moderate in the surface layer and subsoil and is slow or very slow in the substratum. The available water capacity is moderate. Runoff is medium to rapid. This soil dries out and warms up slowly in spring. It has a low shrink-swell potential. Unless limed, this soil is very strongly acid through medium acid in the surface layer and subsoil and very strongly acid through slightly acid in the substratum.

Most areas of this soil are woodland. A small acreage is cleared and used for pasture or is idle. A rapidly increasing acreage is used for community development.

This soil has fair potential for community development. It is limited mainly by the seasonal high water table at a depth of about 20 inches, the slowly or very slowly permeable substratum, stoniness, and, in places, by the steepness of slopes. This soil is fairly easy to excavate, but generally has stones and boulders in the profile as well as on the surface. The seasonal high water table frequently inundates excavations. The steep slopes of excavations are unstable when saturated and tend to slump. If homes with basements are built on this soil, the basements generally are below the depth of the seasonal high water table and are wet unless properly constructed. Waste disposal systems, such as septic tank absorption fields, generally do not function properly because of the seasonal high water table and the slowly or very slowly permeable substratum. Very careful and often costly design and installation are required to insure that septic systems function satisfactorily. Particular care must be taken to prevent effluent from seeping to the surface in areas downslope, especially if the system is installed on the steeper slopes. In places, the stones and boulders hinder the installation of septic tank absorption fields. They also limit the use of this soil for landscaping. The removal of stones and boulders is costly. Large boulders, however, are sometimes desired for their esthetic value and are left undisturbed. During periods of construction, conservation measures are needed to control runoff, erosion, and sedimentation.

This soil is poorly suited to crops because of the stoniness. The use of modern farming equipment is not feasible unless the stones and boulders are removed. The erosion hazard is moderate to severe, and conservation measures such as the use of a permanent vegetative cover are needed to control runoff and erosion.

This soil is well suited to growing trees. Productivity is moderately high. The stones and boulders hinder somewhat the use of some harvesting equipment and make machine planting generally unfeasible. Trees to favor in existing woodlots are eastern white pine and northern red oak. Trees to plant in open areas are eastern white pine and European larch.

The included soils have poor potential for septic tank absorption systems. The Wethersfield soils are limited by a slowly or very slowly permeable substratum, the Yalesville soils by bedrock at a depth of 20 to 40 inches, the Watchaug soils by a seasonal high water table at a depth of about 20 inches, and the Wilbraham soils by a high water table that is at a depth of about 6 inches from fall until mid-spring and by a slowly permeable or very slowly permeable substratum. Capability subclass VIIs; woodland suitability subclass 3x.

MgA—Manchester gravelly sandy loam, 0 to 3 percent slopes. This is a nearly level, excessively drained soil on outwash terraces of stream valleys. Slopes are smooth or convex and mainly are less than 200 feet long. The areas dominantly are irregular in shape and 5 to 30 acres in size.

Typically, the surface layer is reddish brown gravelly sandy loam 6 inches thick. The subsoil is yellowish red gravelly sandy loam and gravelly loamy sand 10 inches thick. The substratum, to a depth of 60 inches, is reddish brown sand and gravel.

Included with this soil in mapping are small intermingled areas, generally less than 1 acre in size, of well drained Branford soils, moderately well drained Ellington soils, and excessively drained Penwood soils. In a few

areas the soils are not so gravelly, and in others the surface layer is gravelly loamy sand. Included soils make up 5 to 15 percent of this map unit.

Permeability is rapid in the surface layer and subsoil and very rapid in the substratum. This soil has a low available water capacity. Runoff is slow. This soil dries out and warms up rapidly in spring. It has a low shrink-swell potential. Unless limed, this soil is very strongly acid through medium acid.

Most areas of this soil have been cleared and are used as cropland. Much of the acreage is now idle. A small acreage is woodland. A rapidly increasing acreage is used for community development.

This soil has good potential for community development. It is easy to excavate; however, the steep slopes of excavations are unstable. The droughtiness of this soil is a major concern in landscaping. Irrigation or sprinkling is needed in summer. Waste disposal systems, such as septic tank absorption fields, function satisfactorily with only normal design and installation; but because the substratum is very rapidly permeable, care must be taken to prevent the pollution of ground water. This soil has good potential as sites for commercial buildings. During periods of construction, runoff, erosion, and siltation are fairly easy to control.

Unless irrigated, this soil has poor potential for most crops because it is droughty. Irrigation is needed to ensure a productive crop. Good tilth is easy to maintain; however, the gravel content of this soil hinders the use of some farming equipment. Many areas can be used to grow hay or for pasture. Controlling runoff and erosion is not a major problem.

This soil is fairly well suited to trees; however, productivity is low because the soil is droughty. Seedling mortality is severe because the soil lacks sufficient moisture to sustain the seedlings. Trees to favor in existing woodlots are eastern white pine and northern red oak. The trees to plant in open areas are eastern white pines.

The included Agawam and Penwood soils are as well suited to community development as the Manchester soil; however, the Agawam soils are also suited to landscaping because they are not droughty. The included Ellington soil has poor potential for septic tank absorption fields because of the seasonal high water table at a depth of about 20 inches. Capability subclass IIIs; woodland suitability subclass 5s.

MgB—Manchester gravelly sandy loam, 3 to 8 percent slopes. This is a gently sloping, excessively drained soil on outwash terraces of stream valleys. Slopes are smooth or complex and are mainly less than 200 feet long. The areas dominantly are irregular in shape and 3 to 45 acres in size.

Typically, the surface layer is reddish brown gravelly sandy loam 6 inches thick. The subsoil is yellowish red gravelly sandy loam and gravelly loamy sand 10 inches thick. The substratum, to a depth of 60 inches, is yellowish brown stratified sand and gravel.

Included with this soil in mapping are small intermingled areas, generally less than 1 acre in size, of excessively drained Penwood soils, well drained Branford soils, and moderately well drained Ellington soils. In a few areas the soils are not so gravelly, and in some areas the surface layer is gravelly loamy sand. A few areas have steeper slopes. Included soils make up 5 to 15 percent of this map unit.

Permeability is rapid in the surface layer and subsoil and very rapid in the substratum. This soil has a low available water capacity. Runoff is medium. This soil dries out and warms up rapidly in spring. It has a low shrink-swell potential. Unless limed, this soil is very strongly acid through medium acid.

Most areas of this soil have been cleared and are used as cropland. Much of the acreage is now idle. A small acreage is woodland. A rapidly increasing acreage is used for community development.

This soil has good potential for community development. It is easy to excavate; however, the steep slopes of excavations are unstable. The droughtiness of this soil is a major concern in landscaping. Irrigation or sprinkling is needed to maintain lawns, shrubs, and trees. Waste disposal systems such as septic tank absorption fields function satisfactorily with normal design and installation; however, because of the very rapid permeability of this soil, caution must be taken to prevent the pollution of ground water. This soil has fair potential for use as sites for commercial buildings and is limited mainly by slopes. During periods of construction, simple conservation measures generally are adequate to prevent excessive runoff, erosion, and siltation.

Unless it is irrigated, this soil has poor potential for most crops because it is droughty. Irrigation is needed to insure a productive crop. Good tilth is easy to maintain; however, the gravel content of this soil hinders the use of some farming equipment. Good organic matter content needs to be maintained. Many areas can be used to grow hay and for pasture. Controlling runoff and erosion requires simple conservation measures.

This soil is fairly well suited to trees; however, productivity is low because this soil is droughty. Seedling mortality is severe because the soil lacks sufficient moisture to sustain the seedlings. Trees to favor in existing woodlots are eastern white pine and northern red oak. The trees to plant in open areas are eastern white pines.

The included Penwood and Branford soils are as well suited to community development as this Manchester soil; however, the Branford soils are better suited to landscaping because they are not droughty. The Ellington soil has poor potential for septic systems because of the seasonal high water table at a depth of about 20 inches. Capability subclass IIIs; woodland suitability subclass 5s.

MgC—Manchester gravelly sandy loam, 8 to 15 percent slopes. This is a sloping, excessively drained soil on outwash terraces of stream valleys. This soil is mainly on the edges of terrace breaks and of outwash terraces where the terraces adjoin the glacial till uplands. Slopes are mainly smooth and are less than 250 feet long. The areas dominantly are irregular or long and narrow in shape and are 3 to 25 acres in size.

Typically, the surface layer of this soil is reddish brown gravelly sandy loam 6 inches thick. The subsoil is yellowish red gravelly sandy loam and gravelly loamy sand 10 inches thick. The substratum, to a depth of 60 inches, is yellowish brown stratified sand and gravel.

Included with this soil in mapping are small intermingled areas, generally less than 1 acre in size, of excessively drained Penwood soils and well drained Branford soils. In a few areas the soils are not so gravelly, and in some areas the surface layer is gravelly loamy sand. A few areas have gentler slopes. Included soils make up 5 to 15 percent of this map unit.

Permeability is rapid in the surface layer and subsoil and very rapid in the substratum. This soil dries out and warms up rapidly in spring. It has a low shrink-swell potential. Unless limed, this soil is very strongly acid through medium acid.

Most areas of this soil are idle or are brushy woodland. A small acreage is used for pasture or as cropland to grow hay. An increasing acreage is used for community development.

This soil has fair potential for community development. It is limited mainly by steep slopes and droughtiness. It is easy to excavate; however, the steep slopes of excavations are unstable. The droughtiness of this soil is a major concern in landscaping. Irrigation or sprinkling is needed in summer. Waste disposal systems such as septic tank absorption fields need careful design and installation to ensure that effluent does not seep to the surface in areas downslope from the leaching system. Because the substratum is very rapidly permeable, caution is needed to prevent pollution of ground water. Intensive conservation measures may be needed to prevent excessive runoff, erosion, and siltation during periods of construction.

This soil has poor potential for farming because it is sloping and droughty. The steepness of slopes makes the installation of a satisfactory irrigation system difficult. Intensive conservation measures are needed to prevent excessive runoff and erosion if this soil is cultivated.

This soil is fairly well suited to trees; however, productivity is low because this soil is droughty. Seedling mortality is severe because the soil lacks sufficient moisture to sustain the seedlings. Trees to favor in existing woodlots are eastern white pine and northern red oak. Trees to plant in open areas are eastern white pines.

The included soils are as well suited to community development as this Manchester soil; however, the Branford soil is better suited to landscaping because it is not droughty. Capability subclass IVs; woodland suitability subclass 5s.

Nn—Ninigret fine sandy loam. This is a nearly level, moderately well drained soil in slightly depressional areas of broad outwash terraces and narrow stream valleys. Slopes are 0 to 3 percent. They are smooth and generally are less than 300 feet long. The areas dominantly are irregular in shape and 3 to 30 acres in size.

Typically, the surface layer is dark brown fine sandy loam 8 inches thick. The subsoil is dominantly dark yellowish brown and yellowish brown, mottled fine sandy loam 17 inches thick. The substratum, to a depth of 60 inches, is brown stratified sand and gravel.

Included with this soil in mapping are small intermingled areas, generally less than 1 acre in size, of well drained Agawam soils and poorly drained Walpole and Raypol soils. In a few small areas, the surface layer is sandy loam. Soils in a few areas in the town of Cheshire have redder colors. Included soils make up 5 to 15 percent of this map unit.

This soil has a seasonal high water table at a depth of about 20 inches from late in fall until mid-spring. Permeability is moderately rapid in the surface layer and subsoil and rapid in the substratum. This soil has a moderate available water capacity. Runoff is slow. This soil dries out and warms up rather slowly in spring. It has a low shrink-swell potential. Unless limed, this soil is very strongly acid through medium acid.

This soil is mainly used as cropland to grow hay and corn. A few areas are used to grow vegetables and nursery stock. Many areas are idle or are woodland. A small but increasing acreage is used for community development.

This soil has fair to poor potential for community development. It is easy to excavate; however, the steep slopes of excavations are unstable. It has poor potential for waste disposal systems, such as septic tank absorption fields, because of the seasonal high water table. Waste from the septic system may pollute the ground water. Foundations and basements need to be properly designed and constructed to insure a stable foundation and to prevent wet basements. This soil is well suited to landscaping. During periods of construction, conservation measures are needed to prevent excessive runoff, erosion, and siltation.

This soil is well suited to crops. Wetness is the major limitation for growing crops. Drainage is generally needed for best crop production. Even if drained, this soil can be wet for several days after heavy rains, and the use of many kinds of farming equipment are restricted. Runoff and erosion are easy to control with simple conservation measures.

This soil is well suited to growing trees. Productivity is moderately high. This soil has no major limitations for growing or harvesting trees. Machine planting is feasible in open areas. Wetness may restrict the use of some

equipment during the wetter parts of the year. The trees to favor in existing woodlots are eastern white pines. Trees to plant in open areas are eastern white pine and white spruce.

The included Agawam soils have greater potential for community development than this Ninigret soil. The Raypol and Walpole soils are less suited to community development because they are poorly drained and have a higher seasonal water table for a longer period. Capability subclass IIw; woodland suitability subclass 3o.

PbB—Paxton fine sandy loam, 3 to 8 percent slopes. This is a gently sloping, well drained soil on the top of drumlins, hills, and ridges of glacial uplands. Slopes are smooth and convex and generally are 100 to 500 feet long. The areas dominantly are oval or long and narrow in shape and 5 to 70 acres in size.

Typically, the surface layer is dark brown fine sandy loam 8 inches thick. The subsoil is dark yellowish brown and olive brown fine sandy loam 18 inches thick. The substratum, to a depth of 60 inches, is olive, very firm gravelly fine sandy loam.

Included with this soil in mapping are small intermingled areas, generally less than 1 acre in size, of moderately well drained Woodbridge soils, well drained Charlton soils, and somewhat excessively drained Hollis soils. In a few areas, stones and boulders are on the surface. The soils in a few areas in Southbury have redder colors in the substratum. Included soils make up 5 to 15 percent of this map unit.

Permeability is moderate in the surface layer and subsoil and slow in the substratum. The available water capacity is moderate. Runoff is medium. This soil tends to dry out and warm up slowly in spring. It has a low shrink-swell potential. Unless limed, this soil is strongly acid through slightly acid.

Most areas of this soil are cropland that is used to grow hay and corn. A few areas are used to grow vegetables, nursery stock, and fruit orchards. A significant and rapidly increasing acreage is used for community development or is idle. The remaining acreage is woodland.

This soil has fair potential for community development. It is fairly easy to excavate, but the substratum is very firm and commonly has stones and boulders. Waste disposal systems, such as septic tank absorption fields, will generally not function satisfactorily because of the slowly permeable substratum. Very careful design and installation are required to insure a satisfactory system. During periods of construction, conservation measures are needed to prevent excessive runoff, erosion, and siltation.

This soil is well suited to cultivated crops. Good tilth is easy to maintain. The hazard of erosion is moderate. Controlling runoff and erosion and maintaining good fertility and organic-matter content are major concerns in managing this soil. If this soil is cultivated, the use of minimum tillage and the use of cover crops and grasses and legumes in the cropping system help to reduce runoff and control erosion. Stones and boulders near the surface are an annoyance in using some tillage equipment.

This soil is well suited to growing trees. Most areas of this soil were cropland at one time, but a few areas are reverting to woodland. Productivity is moderately high. Machine planting is practical in open areas. Trees to favor in existing woodlots are eastern white pine, sugar maple, and northern red oak. Trees to plant in open areas are eastern white pine, European larch, and Norway spruce.

The included Charlton soils have good potential for community development. The Woodbridge and Hollis soils have poor potential for septic systems. The Woodbridge soils are limited for this use by a slowly permeable substratum and a seasonal high water table at a depth of about 20 inches, and the Hollis soils by bedrock at a depth of 10 to 20 inches. Capability subclass IIe; woodland suitability subclass 3o.

PbC—Paxton fine sandy loam, 8 to 15 percent slopes. This sloping, well drained soil is on the sides of drumlins, ridges, and hills of glacial uplands. Slopes are smooth and convex and generally are 150 to 500 feet long. The areas dominantly are oval or long and narrow in shape and 5 to 60 acres in size.

Typically, the surface layer is dark brown fine sandy loam 8 inches thick. The subsoil is dark yellowish brown and olive brown fine sandy loam 18 inches thick. The substratum, to a depth of 60 inches, is olive, very firm gravelly fine sandy loam.

Included with this soil in mapping are small intermingled areas, generally less than 1 acre in size, of moderately well drained Woodbridge soils, well drained Charlton soils, and somewhat excessively drained Hollis soils. In a few small areas, stones and boulders are on the surface. Soils in a few areas in Southbury have redder colors in the substratum. Included soils make up 5 to 15 percent of this map unit.

Permeability is moderate in the surface layer and subsoil and slow in the substratum. The available water capacity is moderate. Runoff is rapid. This soil tends to dry out and warm up slowly in spring. It has a low shrink-swell potential. Unless limed, this soil is strongly acid through slightly acid.

Most areas of this soil are cropland used to grow hay and corn. A few areas are in fruit orchards. A significant and rapidly increasing acreage is idle or is used for community development. The remaining acreage is woodland.

This soil has fair potential for community development. It is limited mainly by the slow permeability of the substratum and the steepness of slopes. The steeper slopes cause additional expense in building roads, installing sewer and water lines, building homes, and in designing

and installing septic systems. This soil is fairly easy to excavate, but the substratum is very firm and generally has stones and boulders. Waste disposal systems, such as septic tank absorption fields, generally do not function satisfactorily without very careful design and installation because the substratum is slowly permeable. Care is needed to insure that effluent does not seep to the surface in areas downslope from the disposal system. Fairly intensive conservation measures are needed to prevent excessive runoff, erosion, and siltation during periods of construction.

This soil is suited to crops; however, there is a severe erosion hazard. Runoff and erosion need to be controlled if this soil is cultivated. Minimum tillage, use of cover crops, stripcropping, and including grasses and legumes in the cropping system are practices that help to reduce runoff and erosion. Good tilth is easy to maintain. Stones and boulders near the surface make the use of some tillage equipment difficult.

This soil is well suited to trees. Most areas of this soil were cropland at one time. A few areas are reverting to trees. Productivity is moderately high. Machine planting of trees is practical in open areas. Trees to favor in existing woodlots are eastern white pine, sugar maple, and northern red oak. Trees to plant in open areas are eastern white pine, European larch, and Norway spruce.

The included Woodbridge soils are poorly suited to septic systems because of a seasonal high water table and slow permeability in the substratum. Charlton soils are fairly well suited to septic systems. The Hollis soils are poorly suited to community development because they have bedrock at a depth of 10 to 20 inches. Capability subclass IIIe; woodland suitability subclass 3o.

PbD—Paxton fine sandy loam, 15 to 25 percent slopes. This moderately steep, well drained soil is on the sides of drumlins, hills, and ridges of glacial uplands. Slopes are smooth and convex and generally are 150 to 600 feet long. The areas are dominantly long and narrow or oval in shape and 5 to 60 acres in size.

Typically, the surface layer is dark brown fine sandy loam 8 inches thick. The subsoil is dark yellowish brown and olive brown fine sandy loam 15 inches thick. The substratum, to a depth of 60 inches, is olive, very firm gravelly fine sandy loam.

Included with this soil in mapping are small intermingled areas, generally less than 1 acre in size, of well drained Charlton soils, moderately well drained Woodbridge soils, and somewhat excessively drained Hollis soils. In a few areas, up to 15 acres in size, as much as 3 percent of the surface is covered with stones and boulders. Included areas make up 5 to 15 percent of this map unit.

Permeability is moderate in the surface layer and subsoil and slow in the substratum. This soil has a moderate available water capacity. Runoff is rapid. This soil tends to dry out and warm up slowly in spring. It has a low shrink-swell potential. Unless limed, this soil is strongly acid through slightly acid.

Most areas of this soil are used for hay or as pasture, or they are idle. A few areas are reverting to woodland. A significant and increasing acreage is used for community development, particularly in the Naugatuck River Valley and in the southwestern part of the county. A few small areas are in fruit orchards.

This soil has poor potential for community development. It is limited mainly by the steepness of slopes and the slowly permeable substratum. Building houses and roads and installing septic systems and water and sewer lines are more expensive on this soil than on less sloping soils. This soil is fairly easy to excavate, but the substratum is very firm and generally has stones and boulders. Because of the slowly permeable substratum, waste disposal systems, such as septic tank absorption fields, generally do not function satisfactorily without very careful design and installation. Precautions need to be taken to insure that effluent does not seep to the surface in areas downslope from the disposal system. Intensive conservation measures are needed to prevent excessive runoff, erosion, and siltation during periods of construction.

This soil is poorly suited to cultivated crops because of the steepness of slopes. The erosion hazard is severe. A good vegetative cover should be maintained. Controlling runoff and erosion is the major concern in managing this soil for farming. The steepness of slopes is a hazard to the safe operation of most farm equipment.

This soil is suited to trees. Productivity is moderately high. Use of equipment is somewhat limited by the steepness of slopes. Machine planting is practical in the open areas, although it is hampered somewhat by slope. Trees to favor in existing woodlots are eastern white pine, northern red oak, and sugar maple. Trees to plant in open areas are eastern white pine, European larch, and Norway spruce.

The included soils have poor potential for septic systems. Charlton soils are limited by the steepness of slopes, Woodbridge soils by a seasonal high water table at a depth of about 20 inches and a slowly permeable substratum, and Hollis soils by bedrock at a depth of 10 to 20 inches. Capability subclass IVe; woodland suitability subclass 3r.

PdB—Paxton very stony fine sandy loam, 3 to 8 percent slopes. This is a gently sloping, well drained soil on the top of drumlins, hills, and ridges of glacial uplands. The surface is 0.1 to 3 percent stones and boulders. Slopes are smooth and convex and generally are 100 to 500 feet long. The areas dominantly are irregular or rectangular in shape and 5 to 50 acres in size.

Typically, the surface layer is dark brown fine sandy loam 6 inches thick. The subsoil is dark yellowish brown and olive brown fine sandy loam 20 inches thick. The

substratum, to a depth of 60 inches, is olive, very firm gravelly fine sandy loam.

Included with this soil in mapping are small intermingled areas, generally less than 1 acre is size, of moderately well drained Woodbridge soils, well drained Charlton soils, and somewhat excessively drained Hollis soils. In a few areas, there are no stones and boulders on the surface. The soils in a few areas in Southbury have redder colors in the substratum. Included soils make up 5 to 15 percent of this map unit.

Permeability is moderate in the surface layer and subsoil and slow in the substratum. This soil has a moderate available water capacity. Runoff is medium. This soil tends to dry out and warm up slowly in spring. It has a low shrink-swell potential. Unless limed, this soil is strongly acid through slightly acid.

Most areas of this soil were cleared and used as cropland or for pasture. In most places, many of the stones and smaller boulders were removed, leaving only the larger ones. Most areas of this soil are reverting to woodland or are idle. A small acreage is used for pasture, and a few areas are used to grow hay. A significant and rapidly increasing acreage is used for community development.

This soil has fair potential for community development. The stones and boulders on the surface interfere with landscaping. This soil is fairly easy to excavate, but the substratum is very firm and commonly has stones and boulders. Waste disposal systems, such as septic tank absorption fields, need very careful design and installation to insure a satisfactory system. Surface stones and boulders may interfere with the installation of the system. During periods of construction, conservation measures are needed to prevent excessive runoff, erosion, and siltation.

This soil is poorly suited to cultivated crops because of the stoniness. If the stones and boulders are removed, this soil is well suited to cultivated crops; however, stone removal is costly. This soil is suited to grasses and legumes, but the stones and boulders interfere with harvesting equipment. The moderate erosion hazard is a major concern of management. Cultivated areas need conservation measures to prevent excessive runoff and erosion.

This soil is well suited to growing trees. Productivity is moderately high. The stones and boulders are a slight hindrance in the use of harvesting and planting equipment; however, machine planting is feasible in open areas. Trees to favor in existing woodlots are eastern white pine, sugar maple, and northern red oak. Trees to plant in open areas are eastern white pine, European larch, and Norway spruce.

The included Woodbridge and Hollis soils are not well suited to community development. They have poor potential for septic systems. The Woodbridge soils are limited for this use by a seasonal high water table at a depth of about 20 inches and a slowly permeable substratum, and the Hollis soils by bedrock at a depth of 10 to 20 inches. The Charlton soils have good potential for onsite septic systems. Capability subclass VIs; woodland suitability subclass 3o.

PdC—Paxton very stony fine sandy loam, 8 to 15 percent slopes. This is a sloping, well drained soil on the sides of drumlins, ridges, and hills of glacial uplands. The surface is 0.1 to 3 percent stones and boulders. Slopes are smooth and convex and generally are 150 to 500 feet long. The areas dominantly are irregular, rectangular, or oval in shape and are mainly 5 to 40 acres in size.

Typically, the surface layer is dark brown fine sandy loam 6 inches thick. The subsoil is dark yellowish brown and olive brown fine sandy loam 20 inches thick. The substratum, to a depth of 60 inches, is olive, very firm gravelly fine sandy loam.

Included with this soil in mapping are small intermingled areas, generally less than 1 acre in size, of moderately well drained Woodbridge soils, well drained Charlton soils, and somewhat excessively drained Hollis soils. In a few small areas, there are no stones and boulders on the surface. The soils in a few areas in Southbury have redder colors in the substratum. Included soils make up 5 to 15 percent of this map unit.

Permeability is moderate in the surface layer and subsoil and slow in the substratum. This soil has a moderate available water capacity. Runoff is rapid. This soil tends to dry out and warm up slowly in spring. It has a low shrink-swell potential. Unless limed, this soil is strongly acid through slightly acid.

Most areas of this soil were cleared and used as cropland or for pasture. In most places, many of the stones and smaller boulders were removed, and only the larger ones remain. Most areas of this soil are reverting to woodland or are idle. A small acreage is used for community development.

This soil has fair potential for community development. It is limited mainly by the steepness of slopes, the slowly permeable substratum, and stoniness. This soil is fairly easy to excavate, but the substratum is very firm and commonly has stones and boulders. Waste disposal systems, such as septic tank absorption fields, generally do not function satisfactorily. Very careful design and installation are required to insure that the system functions properly and that effluent does not seep to the surface in areas downslope from the system. Stones and boulders may interfere with installation. Landscaping is hindered by the stoniness. Intensive conservation measures are needed to prevent excessive runoff, erosion, and siltation during periods of construction.

This soil is poorly suited to cultivated crops because of its stoniness, and stone removal is costly. This soil is suited to grasses and legumes; however, the stones and boulders interfere with harvesting equipment. The severe erosion hazard is a major concern of management. If this

soil is cultivated, intensive conservation measures are needed to control runoff and erosion.

This soil is suited to growing trees. Productivity is moderately high. The stones and boulders are a hindrance in the use of harvesting and planting equipment; however, machine planting is feasible in open areas. Trees to favor in existing stands are eastern white pine, sugar maple, and northern red oak. Trees to plant in open areas are eastern white pine, European larch, and Norway spruce.

The included Woodbridge and Hollis soils are not well suited to community development. They have poor potential for septic systems. The Woodbridge soils are limited for this use by a seasonal high water table at a depth of about 20 inches and a slowly permeable substratum, and the Hollis soils by bedrock at a depth of 10 to 20 inches. The Charlton soils have fair potential for septic systems and are limited mainly by the steepness of slopes and stoniness. Capability subclass VIs; woodland suitability subclass 3o.

PeC—Paxton extremely stony fine sandy loam, 3 to 15 percent slopes. This is a gently sloping and sloping, well drained soil on drumlins, ridges, and hills of glacial uplands. The surface is 3 to 25 percent stones and boulders. Slopes mainly are smooth and convex and generally are 150 to 600 feet long. The areas are dominantly oval, irregular, or rectangular in shape and are mainly 5 to 80 acres in size.

Typically, the surface layer is dark brown fine sandy loam 2 inches thick. The subsoil is dark brown, dark yellowish brown, and olive brown fine sandy loam 24 inches thick. The substratum, to a depth of 60 inches, is olive, very firm gravelly fine sandy loam.

Included with this soil in mapping are small intermingled areas, generally less than 1 acre in size, of moderately well drained Woodbridge soils, well drained Charlton soils, and somewhat excessively drained Hollis soils. In a few small areas, less than 3 percent of the surface is covered with stones and boulders. The soils in a few areas in Southbury have redder colors in the substratum. The included soils make up 5 to 15 percent of this map unit.

Permeability is moderate in the surface layer and subsoil and slow in the substratum. The available water capacity is moderate. Runoff is medium to rapid. This soil tends to dry out and warm up slowly in spring. It has a low shrink-swell potential. Unless limed, this soil is strongly acid through slightly acid.

Most areas of this soil are woodland. A small acreage is cleared and is used for pasture or is idle. A rapidly increasing acreage is used for community development.

This soil has fair potential for community development. It is limited mainly by stoniness and, in places, by the steepness of slopes. Removal of stones and boulders is costly. Waste disposal systems, such as septic tank absorption fields, must be carefully designed and installed to insure that the system functions properly and that effluent does not seep to the surface in areas downslope from the system. In many places, stones and boulders interfere with installation. Stoniness severely limits the use of this soil for landscaping; however, large boulders are sometimes desired for their esthetic value and are left undisturbed. During periods of construction, conservation measures are needed to prevent excessive runoff, erosion, and siltation.

This soil is poorly suited to crops because of its stoniness. The stones and boulders generally are very costly to remove, and the use of modern farming equipment is not feasible without their removal. The erosion hazard is moderate to severe. Conservation measures such as the use of a permanent vegetative cover help to control runoff and erosion.

This soil is suited to trees. Productivity is moderately high. The stones and boulders are a hindrance to the use of some harvesting equipment, and they make machine planting generally unfeasible. Trees to favor in existing woodlots are eastern white pine, sugar maple, and northern red oak. Trees to plant in open areas are eastern white pine, European larch, and Norway spruce.

The included Woodbridge and Hollis soils are not well suited to community development. The Woodbridge soils are limited for onsite septic systems by the seasonal high water table at a depth of about 20 inches and a slowly permeable substratum, and the Hollis soils by bedrock at a depth of 10 to 20 inches. The included Charlton soils have fair potential for community development and are limited mainly by stoniness and, in places, the steepness of slopes. Capability subclass VIIs; woodland suitability subclass 3x.

PeD—Paxton extremely stony fine sandy loam, 15 to 35 percent slopes. This is a moderately steep and steep, well drained soil on the sides of the drumlins, ridges, and hills of glacial uplands. The surface is 3 to 25 percent stones and boulders. Slopes mainly are smooth and convex and are 150 to 800 feet long. The areas dominantly are long and narrow or irregular in shape and are mainly 5 to 100 acres in size.

Typically, the surface layer is dark brown fine sandy loam 2 inches thick. The subsoil is dark brown, dark yellowish brown, and olive brown fine sandy loam 22 inches thick. The substratum, to a depth of 60 inches, is olive, very firm gravelly fine sandy loam.

Included with this soil in mapping are small intermingled areas, generally less than 1 acre in size, of somewhat excessively drained Hollis soils, well drained Charlton soils, and moderately well drained Woodbridge soils. In a few small areas, less than 3 percent of the surface is covered with stones and boulders. The soils in a few areas in Southbury have redder colors in the substratum. Included soils make up 5 to 15 percent of this map unit.

Permeability is moderate in the surface layer and subsoil and slow in the substratum. The available water

capacity is moderate. Runoff is rapid. This soil tends to dry out and warm up slowly in spring. It has a low shrink-swell potential. Unless limed, this soil is strongly acid through slightly acid.

Most areas of this soil are woodland, and a small acreage is cleared and is used for pasture or is idle. A small but increasing acreage is used for community development.

This soil has poor potential for community development, mainly because of the steep slopes and stoniness. Removal of stones and boulders is costly. Waste disposal systems, such as septic tank absorption fields, must be carefully designed and installed to insure that the system functions properly and that effluent does not seep to the surface in areas downslope. During periods of construction, intensive conservation measures such as the use of temporary vegetative cover, diversions, and siltation basins frequently are needed to prevent excessive runoff and erosion. Landscaping is difficult because of the stoniness and steep slopes; however, stones and boulders, especially the large ones, in places are left undisturbed because of their esthetic value. This soil provides good sites for houses of unusual design.

This soil is poorly suited to cultivated crops because of steep slopes. The erosion hazard is severe. A good vegetative cover should be maintained. Controlling runoff and erosion is the major concern when managing this soil for farming. The steep slopes limit the safe operation of most farming equipment, and safety precautions must be exercised when operating equipment on this soil.

This soil is suited to growing trees. Productivity is moderately high. The use of equipment is somewhat limited by steep slopes. Trees to favor in existing woodlots are eastern white pine, sugar maple, and northern red oak. Trees to plant in open areas are eastern white pine, European larch, and Norway spruce.

The included soils are also poorly suited to community development because of the steep slopes and stoniness. The Woodbridge soils have a seasonal high water table at a depth of about 20 inches and a slowly permeable substratum. The Hollis soils have bedrock at a depth of 10 to 20 inches. Capability subclass VIIs; woodland suitability subclass 3x.

PnA—Penwood loamy sand, 0 to 3 percent slopes. This is a nearly level, excessively drained soil on outwash terraces of the larger stream valleys. Slopes are smooth and are mainly less than 400 feet long. The areas dominantly are irregular in shape and 5 to 300 acres in size.

Typically, the surface layer is dark brown loamy sand 8 inches thick. The upper part of the subsoil is yellowish red loamy sand 10 inches thick, and the lower part is reddish brown sand 12 inches thick. The substratum, to a depth of 60 inches, is reddish brown sand.

Included with this soil in mapping are small intermingled areas, generally less than 1 acre in size, of excessively drained Manchester soils and moderately well drained Deerfield soils. In a few small areas, gravel-sized fragments make up as much as 20 percent of the substratum. In a few larger areas, the substratum is coarse sand. Included soils make up 5 to 15 percent of this map unit.

Permeability is rapid. This soil has a low available water capacity. Runoff is slow. This soil dries out and warms up rapidly in spring. It has a low shrink-swell potential. Unless limed, this soil is very strongly acid through slightly acid.

Most areas of this soil are near urban areas and are rapidly being developed for urban uses. A considerable acreage is idle. A small acreage is woodland. A few small areas are used for farming, mainly to grow vegetables (fig. 7).

This soil has good potential for community development. It is easy to excavate; however, the steep slopes of excavations are unstable. The droughtiness of this soil is a major concern in landscaping. Irrigation or sprinkling is needed in summer. Waste disposal systems, such as septic tank absorption fields, function satisfactorily with normal design and installation; however, because of the rapid permeability of this soil, caution is needed to prevent the pollution of ground water. During periods of construction, runoff, erosion, and siltation are easy to control.

This soil has poor potential for most crops because it is droughty. Irrigation is needed to insure a productive crop. Good tilth is easy to maintain. Controlling runoff and erosion is not a major problem.

This soil is poorly suited to trees because it is droughty. Productivity is low. Seedling mortality is severe because the soil lacks sufficient moisture to sustain the seedlings. Trees to favor in existing woodlots are eastern white pine, pitch pine, and northern red oak. The trees to plant in open areas are eastern white pine.

The potential of the included Manchester soils for community development is similar to that of the Penwood soil. The included Deerfield soils have poor potential for septic systems because of the seasonal high water table at a depth of about 20 inches. Capability subclass IIIs; woodland suitability subclass 5s.

PnB—Penwood loamy sand, 3 to 8 percent slopes. This is a gently sloping, excessively drained soil on outwash terraces of the larger stream valleys. Slopes are smooth and are mainly less than 400 feet long. The areas dominantly are irregular in shape and 3 to 80 acres in size.

Typically, the surface layer is dark brown loamy sand 8 inches thick. The upper part of the subsoil is yellowish red loamy sand 10 inches thick, and the lower part is reddish brown sand 12 inches thick. The substratum, to a depth of 60 inches, is reddish brown sand.

Included with this soil in mapping are small intermingled areas, generally less than 1 acre in size, of the

excessively drained Manchester soils and the moderately well drained Deerfield soils. In a few small areas, fragments make up as much as 20 percent of the substratum. In a few larger areas, the substratum is coarse sand. Included areas make up 5 to 15 percent of this map unit.

Permeability is rapid. This soil has a low available water capacity. Runoff is medium. This soil dries out and warms up rapidly in spring. It has a low shrink-swell potential. Unless limed, this soil is very strongly acid through slightly acid.

Most areas of this soil are near urban areas and are rapidly being developed for urban uses. A considerable acreage is idle. A small acreage is woodland.

This soil has good potential for community development. It is easy to excavate; however, the steep slopes of excavations are unstable. The droughtiness of this soil is a major concern in landscaping. Irrigation or sprinkling is needed in summer. Waste disposal systems, such as septic tank absorption fields, function satisfactorily with normal design and installation; but because the substratum is rapidly permeable, caution is needed to prevent the pollution of ground water. This soil has fair potential for commercial buildings and is limited mainly by the steep slopes. During periods of construction, simple conservation measures generally are adequate to prevent excessive runoff, erosion, and siltation.

Unless it is irrigated, this soil has poor potential for most crops because it is droughty. Irrigation is needed to insure a productive crop. Tilth is easy to maintain. The organic-matter content needs to be maintained. Simple conservation measures are needed to control runoff and erosion.

This soil is poorly suited to trees because it is droughty. Productivity is low. Seedling mortality is severe because the soil lacks sufficient moisture to sustain the seedlings. Trees to favor in existing woodlots are eastern white pine, pitch pine, and northern red oak. The trees to plant in open areas are eastern white pine.

The potential of the included Manchester soil for community developement is similar to that of the Penwood soil. The included Deerfield soil has poor potential for septic systems because of the seasonal high water table at a depth of about 20 inches. Capability subclass IIIs; woodland suitability subclass 5s.

Pr—Pits, gravel. This map unit consists of areas that have been excavated for sand or gravel. The areas are mostly on broad outwash plains and terraces of stream valleys. They lack vegetation, except for a few drought-resistant plants. Slopes are mostly 0 to 25 percent, and steep escarpments are along the edges of most pits. Areas are mostly 3 to 30 acres in size.

Included with this miscellaneous area in mapping are small intermingled areas, generally less than 1 acre in size, of Hinckley, Manchester, and Penwood soils. A few small areas have bedrock outcrops or small bodies of water. A few areas have been used for community development.

The soil material is mostly sand or sand and gravel. Permeability is rapid or very rapid. In places, the water table is at or near the surface much of the year. A few areas adjacent to streams are subject to flooding.

Areas require onsite investigation and evaluation for most land use decisions. Capability subclass and woodland suitability subclass not assigned.

Ps—Podunk fine sandy loam. This nearly level, moderately well drained soil is on the flood plains of the major streams and their tributaries. Slopes are 0 to 3 percent. They are smooth and mostly 50 to 200 feet long. The areas are dominantly long and narrow or irregular in shape. They are mostly 3 to 60 acres in size.

Typically, there is 3 inches of decomposed and undecomposed litter on top of the surface layer. The surface layer is very dark grayish brown fine sandy loam 5 inches thick. The subsoil is 29 inches thick; it is 9 inches of brown fine sandy loam over 20 inches of dark brown, mottled sandy loam. The substratum, described to a depth of 60 inches, is yellowish brown sand with a few layers of gravel 2 inches thick.

Included with this soil in mapping are small intermingled areas, generally less than 1 acre in size, of somewhat excessively drained Hinckley soils, well drained Agawam soils, and poorly drained Rumney and Walpole soils. A few areas have a sandy loam surface layer and subsoil. A few areas in the central part of the county have redder colors. A few small areas are well drained and have a seasonal high water table at a depth of 50 inches. Included areas make up 5 to 15 percent of this map unit.

This soil has a seasonal high water table at a depth of about 20 inches from late in fall until mid-spring. It is subject to frequent flooding, especially from fall through spring. Permeability is moderately rapid in the surface layer and subsoil and rapid in the substratum. This soil has a moderate available water capacity. Runoff is slow. This soil dries out and warms rather slowly in spring. It has a low shrink-swell potential. Unless limed, it is very strongly acid through medium acid.

This soil is mostly in woodland. A few areas are cleared and used for hay, corn, and pasture. A few areas are cleared and are idle. A small acreage is used for community development.

This soil has poor potential for community development. It is limited mainly by its susceptibility to flooding. It is easy to excavate; however, the water table inundates the excavations. The steep slopes of excavations are unstable. This soil has poor potential for waste disposal systems, such as tank absorption fields, because of the seasonal high water table and the susceptibility to flooding. In addition, the septic system may pollute the ground water. This soil is poorly suited to homesites because of the flooding. It is poorly suited to landscaping

because it floods and because sediment is often deposited by the floodwaters.

This soil is suited to crops. Wetness is a major limiting factor for growing crops, and drainage is generally needed for best crop production. Even with drainage, this soil may remain wet for a few days after heavy rains, restricting the use of many kinds of farming equipment. Crops may be damaged or lost when this soil floods during the growing season. Runoff and erosion are easy to control with simple conservation measures.

This soil is well suited to trees. Productivity is moderately high. This soil has no major limitations for growing or harvesting trees. Machine planting is feasible in open areas. Wetness or flooding may restrict the use of equipment during the wetter parts of the year. Trees to favor in existing woodlots are eastern white pine. Trees to plant are eastern white pine and white spruce.

The included Hinckley and Agawam soils have good potential for community development. The Rumney and Walpole soils have poor potential for community development because they have a seasonal high water table at a depth of about 8 inches. Rumney soils are also subject to frequent flooding. Capability subclass IIw; woodland suitability subclass 3o.

Pv—Podunk Variant silt loam. This nearly level, moderately well drained soil is on flood plains of the major streams and their tributaries. Slopes are 0 to 3 percent. They are smooth and mostly 50 to 200 feet long. The areas are dominantly long and narrow in shape. They are mostly 3 to 35 acres in size.

Typically, the surface layer is dark brown silt loam 9 inches thick. The subsoil, 17 inches thick, is reddish brown silt loam that is mottled in the lower part. The substratum, to a depth of 60 inches, is 10 inches of reddish brown, mottled silt loam over dark gray medium sand.

Included with this soil in mapping are small intermingled areas, generally less than 1 acre in size, of somewhat excessively drained Manchester soils, well drained Branford soils, and poorly drained Rumney Variant and Raypol soils. In a few small areas, the soil is deeper than 40 inches to the sand or sand and gravel. Included areas make up 5 to 15 percent of this map unit.

This soil has a seasonal high water table at a depth of about 20 inches from late fall until mid-spring. It is subject to frequent flooding from fall through spring. Permeability is moderately slow to moderate in the surface layer, subsoil, and the loamy upper part of the substratum. It is rapid in the lower part of the substratum, which is coarse textured. This soil has a high available water capacity. Runoff is slow. This soil dries out and warms rather slowly in spring. It has a low shrink-swell potential. Unless limed, it is very strongly acid through medium acid.

This soil is mostly in woodland or it is cleared and is idle. A few areas are used for hay, corn, pasture, and nursery stock. A small acreage is used for community development.

This soil has poor potential for community development. It is limited mainly by its susceptibility to flooding. It is easy to excavate; however, the water table inundates the excavations. The steep slopes of excavations are unstable. This soil has poor potential for waste disposal systems, such as septic tank absorption fields, because of the seasonal high water table and the susceptibility to flooding. In addition, the septic system may pollute the ground water. This soil is poorly suited to use as sites for houses because of flooding. It is poorly suited to landscaping because of flooding, and sediment is often deposited by the floodwaters.

This soil is suited to crops. Wetness is the major limiting factor for growing crops, and drainage is generally needed for best crop production. Even with drainage, this soil remains wet for several days after a heavy rain, restricting the use of many kinds of farming equipment. Crops may be damaged or lost if this soil is flooded during the growing season. Runoff and erosion are easy to control with simple conservation measures.

This soil is well suited to trees. Productivity is moderately high. This soil has no major limitations to growing or harvesting trees. Machine planting is feasible in open areas. Wetness or flooding may restrict the use of equipment in wetter periods. Trees to favor in existing woodlots are eastern white pine and northern red oak. Trees to plant are eastern white pine and European larch.

The included Manchester and Branford soils have good potential for community development. The Raypol soils have poor potential for community development because they have a seasonal high water table at a depth of about 8 inches. The Rumney Variant soils are also subject to frequent flooding. Capability subclass IIw; woodland suitability subclass 3o.

Qu—Quarries. These are miscellaneous areas where bedrock has been excavated. They are mostly on the higher hills and ridges where the relief is affected by the underlying bedrock. These areas are mostly 3 to 125 acres in size. The largest quarry is in North Branford.

Included in mapping are small intermingled areas, generally less than 1 acre in size, of Hollis and Holyoke soils.

Quarries are nearly barren of vegetation. Many small quarries have been abandoned and have a sparse brushy vegetation. There are small ponds in a few quarries. Quarries require onsite investigation and evaluation if they are to be considered for other land uses. Capability subclass and woodland suitability subclass not assigned.

Ra—Raynham silt loam. This soil is nearly level and poorly drained. It is in depressional areas of broad glacial lake and outwash terraces. Slopes are 0 to 3 percent and are smooth and concave. They are mostly 100

to 300 feet long. The areas are dominantly irregular in shape. They are mostly 3 to 30 acres in size.

Typically, the surface layer is very dark grayish brown silt loam 6 inches thick. The subsoil is 17 inches thick. It is light brownish gray, mottled very fine sandy loam in the upper 5 inches and reddish brown, mottled silt loam below that. The substratum, to a depth of 60 inches, is reddish brown, mottled silt loam 9 inches thick over dark reddish brown, mottled very fine sandy loam. This soil is redder in color and is more acid than Raynham soils in other survey areas, but this does not affect its use and management.

Included with this soil in mapping are small intermingled areas, generally less than 1 acre in size, of the moderately well drained Ellington and Scio soils and the poorly drained Raypol soils. Included areas make up 5 to 15 percent of this map unit.

This soil has a seasonal high water table at a depth of about 8 inches from fall until mid-spring. Permeability is moderate or moderately slow in the surface layer and subsoil and slow in the substratum. This soil has a high available water capacity. Runoff is slow. This soil dries out and warms up slowly in the spring. It has a low shrink-swell potential. Unless limed, this soil is strongly acid through slightly acid in the surface layer and subsoil and medium acid through neutral in the substratum.

This soil is mainly used as woodland, or it is cleared and is idle. A few areas are used for hay, corn, and pasture. A small acreage is used for community development and industrial buildings.

This soil has poor potential for community development. It is fairly easy to excavate. However, water inundates the excavations, and the steep slopes of the excavations are unstable when saturated. This soil has poor potential for waste disposal systems, such as septic tank absorption fields, because of the seasonal high water table and the slowly permeable substratum. Attention needs to be given to properly designing and constructing foundations and basements to insure a stable foundation and to prevent wet basements. This often requires extensive filling. This soil is commonly difficult to drain. During periods of construction, conservation measures are needed to prevent excessive siltation, runoff, and erosion.

This soil is not well suited to use as cropland. Wetness is the major limiting factor for crops, and drainage is needed for good crop production. Even with drainage, this soil remains wet for several days after a heavy rain, restricting the use of most kinds of farming equipment. Runoff and erosion are easy to control with simple conservation measures, such as the use of cover crops during winter.

This soil is suited to trees. It has moderate productivity. It is limited mainly by wetness. The use of equipment is restricted if the soil is wet. Seedling mortality is high, and tree windthrow is common because the high water table restricts the rooting depth. Machine planting is feasible if the soil is not wet. Trees to favor in existing woodlots are eastern white pine. Trees to plant are eastern white pine, white spruce, and northern white-cedar.

The included Ellington and Scio soils have greater potential for community development than the Raynham soil because they do not have so high a seasonal water table. The included Raypol soils have a potential for community development similar to that of this Raynham soil. Capability subclass IIIw; woodland suitability subclass 4w.

Rb—Raypol silt loam. This nearly level, poorly drained soil is in depressions on broad glacial lake and outwash terraces. Slopes are 0 to 3 percent and are smooth and concave. They are mostly 100 to 300 feet long. The areas are dominantly irregular in shape and are mostly 3 to 45 acres in size.

Typically, the surface layer is very dark brown silt loam 8 inches thick. The subsoil is 21 inches thick; it is grayish brown, dark yellowish brown, and olive brown, mottled silt loam and very fine sandy loam. The substratum, to a depth of 60 inches, is light olive brown, mottled gravelly sand.

Included with this soil in mapping are small intermingled areas, generally less than 1 acre in size, of moderately well drained Ellington and Ninigret soils and poorly drained Raynham and Walpole soils. Included areas make up 5 to 15 percent of this map unit.

This soil has a seasonal high water table at a depth of about 8 inches from fall until mid-spring. Permeability is moderate in the surface layer and subsoil and rapid or very rapid in the substratum. This soil has a high available water capacity. Runoff is slow. This soil dries out and warms slowly in the spring. It has a low shrink-swell potential. Unless limed, this soil is very strongly acid or strongly acid in the surface layer and subsoil and strongly acid through slightly acid in the substratum.

This soil is mainly used as woodland, or it is cleared and is idle. A few areas are used to grow hay, corn, pasture, and vegetables. A small acreage is used for community development and as industrial sites. This soil has poor potential for community development. It is easy to excavate; however, water inundates the excavations, and steep slopes of excavations are unstable when saturated. This soil has poor potential for waste disposal systems, such as septic tank absorption fields, because of the seasonal high water table. In addition, the septic system may pollute the ground water. Attention needs to be given to properly designing and constructing foundations and basements to insure a stable foundation and prevent wet basements. This usually requires extensive filling. This soil is poorly suited to landscaping because it is wet and soggy much of the year. Many plants do not adapt to the wetness. During periods of construction, conservation measures are needed to prevent excessive runoff, erosion, and siltation.

This soil is not well suited to use as cropland. Wetness is the major limiting factor for growing crops, and drainage is generally needed for good crop production. Even with drainage, this soil remains wet for several days after a heavy rain, restricting the use of most kinds of farming equipment. Runoff and erosion are easy to control with simple conservation measures, such as the use of cover crops during winter.

This soil is suited to trees. It has moderate productivity. It is limited by wetness. The use of equipment is restricted when the soil is wet. Seedling mortality is high, and tree windthrow is common because the high water table restricts rooting depth. Machine planting is feasible when the soil is not wet. Trees to favor in existing woodlots are eastern white pine and red maple. Trees to plant are eastern white pine, northern white-cedar, white spruce, and eastern hemlock.

The included Ellington and Scio soils have greater potential for community development than this Raypol soil because they do not have so high a seasonal high water table. The included Raynham and Walpole soils have a potential for community development similar to that of this soil. Capability subclass IIIw; woodland suitability subclass 4w.

Rd—Ridgebury fine sandy loam. This is a nearly level, poorly drained soil in drainageways and depressions on glacial uplands. Slopes range from 0 to 3 percent, are smooth and concave, and are mostly 50 to 300 feet long. The areas are dominantly long and narrow or irregular in shape. They are mostly 3 to 30 acres in size.

Typically, the surface layer is very dark brown fine sandy loam 8 inches thick. The subsoil is grayish brown, mottled fine sandy loam 11 inches thick. The substratum, to a depth of 60 inches, is olive, mottled, very firm gravelly sandy loam.

Included with this soil in mapping are small intermingled areas, generally less than 1 acre in size, of the moderately well drained Sutton and Woodbridge soils, the poorly drained Leicester soils, and the very poorly drained Whitman soils. Also included are areas where the surface layer is silt loam and a few areas that have up to 3 percent of the surface covered with stones and boulders. Included areas make up 5 to 15 percent of this map unit.

This soil has a seasonal high water table at a depth of about 8 inches from late in fall until mid-spring. In summer, the water table may drop to a depth of 5 feet or more. This soil has moderate or moderately rapid permeability in the surface layer and subsoil and slow or very slow permeability in the substratum. It has a moderate available water capacity. Runoff is slow. Good tilth is fairly easy to maintain. This soil dries out and warms slowly in spring. It remains wet for several days after heavy rains in summer. It has a low shrink-swell potential. Unless limed, this soil is very strongly acid through medium acid.

In most areas, this soil is cleared and is used to grow hay, is idle, or is used for pasture. A small acreage has reverted to woodland. An increasing acreage is used for community development.

This soil has poor potential for community development. It is limited mainly by its high water table and the slowly permeable substratum. This soil is difficult to excavate because the high water table inundates the excavations. Steep slopes of excavations tend to slump when saturated. This soil is poorly suited to building foundations and basements because footings are placed below the depth of the high water table. Waste disposal systems, such as septic tank absorption fields, do not function satisfactorily without careful and costly design and installation because of the slowly permeable substratum and the high water table. Many areas are subject to ponding during the winter months. This soil is poorly suited to landscaping because of wetness. Even during the summer it remains wet for several days after rains and is frequently soggy and difficult to mow. Many plants do not adapt to the wetness of this soil. During periods of construction, conservation measures are needed to prevent excessive siltation, runoff, and erosion.

This soil is fairly well suited to crops. Wetness is the major limiting factor for most crops, and drainage is needed for good crop production. Erosion is easy to control.

This soil is fairly well suited to trees. It is limited mainly by wetness. Productivity is moderate. The use of equipment is severely limited by wetness. Machine planting is practical in open areas. Seedling mortality is high, and tree windthrow is common because the high water table restricts the rooting zone of the trees. Trees to favor in existing woodlots are eastern white pine, sugar maple, and northern red oak. Trees to plant are eastern white pine and white spruce.

The included Sutton and Woodbridge soils are better suited to community development because they have a lower seasonal high water table. The Leicester soils have a potential for community development similar to that of the Ridgebury soils, but they have a more permeable substratum. The Whitman soils have less potential because they have a higher water table and are wet for longer periods during the year. Capability subclass IIIw; woodland suitability subclass 4w.

RN—Ridgebury, Leicester, and Whitman extremely stony fine sandy loams. This undifferentiated group consists of nearly level to gently sloping, poorly drained and very poorly drained soils in drainageways and depressions on glacial uplands. Slopes are 0 to 5 percent and are mostly 50 to 300 feet long. Stones and boulders cover 3 to 25 percent of the surface. Approximately 40 percent of the acreage consists of Ridgebury extremely stony fine sandy loam, about 35 percent is Leicester extremely stony fine sandy loam, about 15 percent is Whitman extremely stony fine sandy loam, and about 10

percent is other soils. The areas of this unit are dominantly long and narrow or irregular in shape. They are mostly 3 to 80 acres in size.

The soils of this unit were not separated in mapping because they react similarly to most uses and to management. The composition of this unit is more variable than that of other units in the survey area, but the mapping and interpretations will not affect the expected use of this unit. Individual areas may have only one of the named soils; other areas may have all three of the soils in this unit. In many places, these soils are in an intricate pattern.

The typical Ridgebury soil has a very dark gray fine sandy loam surface layer 6 inches thick. The subsoil is mottled, grayish brown fine sandy loam 13 inches thick. The substratum, to a depth of 60 inches, is mottled, olive, very firm gravelly sandy loam.

Typically, the Leicester soil has a black fine sandy loam surface layer 6 inches thick. The subsoil is 17 inches thick. It is mottled, grayish brown, light grayish brown, and pale brown fine sandy loam. The substratum, to a depth of 60 inches, is mottled, dark yellowish brown, friable, gravelly fine sandy loam that has discontinuous firm lenses up to 4 inches thick.

The Whitman soil typically has 4 inches of decomposed and undecomposed litter over a black fine sandy loam surface layer, which is 6 inches thick. The subsoil is gray mottled fine sandy loam 16 inches thick. The substratum, to a depth of 60 inches, is olive, mottled, very firm gravelly sandy loam.

Included in mapping are areas, up to 3 acres in size, of the poorly drained Walpole soils, the very poorly drained Palms soils, and the moderately well drained Sutton and Woodbridge soils. In a few areas the surface is more than 25 percent stones and boulders, and in a few small areas slopes range to 10 percent. In a few areas, the surface layer is silt loam.

The Ridgebury and Leicester soils have a seasonal high water table at a depth of about 8 inches from late fall until mid-spring. The Whitman soils have a water table at the surface from fall through spring and after heavy rains. In many places, they are ponded for several weeks in winter. In summer, the water table may drop to a depth of 5 feet or more. These soils have moderate or moderately rapid permeability in the surface layer and subsoil. The Ridgebury and Whitman soils have slow or very slow permeability in the substratum, and the Leicester soils have moderate or moderately rapid permeability in the substratum. These soils have a high available water capacity. Runoff is slow or very slow. They have a low shrink-swell potential. Unless limed, the Leicester and Ridgebury soils are very strongly acid through medium acid; the Whitman soils are very strongly acid through slightly acid.

Most of this unit is in woodland. A few small areas are used for pasture or are idle. Only a few small areas are cleared and are used for community development.

The soils of this unit have poor potential for community development. They are limited mainly by their seasonal high water table and stoniness. The Ridgebury and Whitman soils are also limited by a slowly permeable substratum. These soils are difficult to excavate because of the high water table and stoniness. The steep slopes of excavations tend to slump when saturated. These soils have poor potential for building foundations and basements because footings are placed below the depth of the high water table. Because of the high water table much of the year and because of the slowly permeable substratum in the Ridgebury and Whitman soils, waste disposal systems, such as septic tank absorption fields, do not function satisfactorily without very unusual and costly design and installation. Even if carefully designed, they often have a high failure rate. The stoniness limits the use of these soils for homesites and landscaping. Removal of stones and boulders is very costly, and small areas are often left undisturbed for their esthetic value. During periods of construction, conservation measures are needed to prevent excessive siltation, runoff, and erosion.

This unit is poorly suited to use as cropland. The use of farming equipment on these soils is not feasible because of the stoniness. Removal of the stones and boulders is very costly and is generally not feasible.

This unit has fair suitability for use as woodland. The Ridgebury and Leicester soils have moderate productivity; the Whitman soils have low productivity. These soils are limited mainly by their wetness and stoniness. Seedling mortality is high and windthrow is common because the high water table restricts the rooting depth for trees during much of the year. Woodland may, however, be one of the best uses of this unit. Trees to favor in existing woodlots are eastern white pine, sugar maple, red maple, and northern red oak. Trees to plant on the Ridgebury and Leicester soils are eastern white pine and white spruce.

The included Sutton and Woodbridge soils are better suited to community development than the major soils. The Walpole and Palms soils have poor potential because of a high or very high water table much of the year. In addition, the Palms soils have 16 to 50 inches of organic material over the mineral soil. Capability subclass VIIs; woodland suitability subclass: Ridgebury and Leicester parts, 4x; Whitman part, 5x.

RP—Rock outcrop-Hollis complex. This complex consists of gently sloping to steep, somewhat excessively drained soils and Rock outcrop on glacial uplands. The relief is affected by the underlying bedrock. Slopes range from 3 to 45 percent. They are mostly convex and mainly 100 to 500 feet long. The areas have a rough surface with bedrock outcrops and a few narrow intermittent drainageways and small wet depressions. In most areas 3 to 25 percent of the surface is covered with stones and boulders. Approximately 50 percent of the

total acreage is Rock outcrop, about 30 percent is Hollis fine sandy loam, and 20 percent is other soils. The areas are dominantly long and narrow or irregular in shape. Many of the small areas are oval in shape. Most areas are 3 to 80 acres in size.

The Rock outcrop and Hollis soils are so intermingled on the landscape that they could not be separated in mapping at the scale used. The composition of this unit is more variable than that of other map units in the survey area, but the mapping and interpretations will not affect the expected use of this unit.

Rock outcrop is bare, hard, exposed bedrock. The typical Hollis soil has a very dark brown fine sandy loam surface layer 3 inches thick. The subsoil is dark brown fine sandy loam 11 inches thick and overlies hard, unweathered schist bedrock.

Included in mapping are areas up to 5 acres in size of the well drained Charlton soils, areas where bedrock is 20 to 40 inches from the surface, and small areas of poorly drained Leicester soils. In the central part of the county, the areas include Holyoke, Yalesville, and Cheshire soils. A few areas of this complex have slopes that range to 100 percent. The included soils make up 10 to 25 percent of this map unit.

The Hollis soil has moderate or moderately rapid permeability above the bedrock. It has a low available water capacity. Runoff is rapid. This soil has a low shrink-swell potential. Reaction is medium acid through very strongly acid. Rock outcrop has very rapid runoff.

Nearly all of this complex is in woodland. A few small cleared areas are idle or are used for pasture. Only a few small isolated areas are used for community development.

This complex has poor potential for community development. It is limited mainly by rock outcrops, shallowness to bedrock, and steepness of slopes. Excavation is very difficult and requires blasting in most places. This complex has poor potential for waste disposal systems, such as septic tank absorption fields. Septic systems on the included soils generally require very unusual design and installation. Even then, the system may fail or effluent may seep into cracks in the bedrock and reach ground water, which is a source of drinking water in many places. Areas of more than 5 acres are generally needed to locate a site where the soils are deep enough for a septic system. This complex provides sites for creatively designed houses. If this complex is disturbed for construction, intensive conservation measures, such as mulching, temporary vegetative cover, and siltation basins, generally are needed to control excessive runoff, erosion, and siltation.

This complex is not suited to crops because of the rock outcrops, stoniness, shallowness to bedrock, and steep slopes.

This complex is poorly suited to trees because of the shallowness to bedrock and rock outcrops; however, woodland may still be its best use. The Hollis soil has low productivity. Seedling mortality is severe because of droughtiness. Tree windthrow is a major problem because the root zone is shallow. The rock outcrops, stoniness, and steep slopes hinder the use of many kinds of harvesting equipment. Machine planting of seedlings is not feasible. Trees to favor in existing woodlots are eastern white pine, northern red oak, and sugar maple. Trees to plant are eastern white pine.

The included Charlton, Yalesville, and Cheshire soils have greater potential for community development than Hollis soils. The Holyoke soils have the same potential as Hollis soils for all common uses. The Leicester soils have poor potential for most uses because the high water table is at a depth of about 8 inches from fall to spring. Capability subclass: Rock outcrop part VIIIs; Hollis part VIIs. Woodland suitability subclass: Rock outcrop part not rated, Hollis part 5d.

Ru—Rumney fine sandy loam. This nearly level, poorly drained soil is on the lower flood plains of the major streams and their tributaries. Slopes are 0 to 3 percent. They are smooth and generally are 50 to 200 feet long. The areas are dominantly long and narrow in shape. They are mostly 3 to 60 acres in size.

Typically, the surface layer is very dark grayish brown fine sandy loam 6 inches thick. The subsoil is 15 inches thick. It is dark grayish brown, mottled silt loam in the upper 4 inches and very dark gray, mottled sandy loam below that. The substratum, to a depth of 60 inches, is black, mottled fine sandy loam in the upper 7 inches and dark brown sand below that. This soil has a more gradual change in texture from the subsoil to the substratum than Rumney soils in other survey areas, but this does not affect use and management.

Included with this soil in mapping are small intermingled areas, generally less than 1 acre in size, of moderately well drained Ninigret and Podunk soils, poorly drained Walpole soils, and very poorly drained Palms soils. A few small areas have a sandy loam surface layer and subsoil. Included areas make up 5 to 15 percent of this map unit.

This soil has a seasonal high water table at a depth of about 8 inches from late fall until mid-spring. Permeability is moderately rapid in the surface layer and subsoil and rapid or very rapid in the substratum. This soil has a moderate available water capacity. Runoff is slow. This soil dries out and warms up slowly in the spring. It has a low shrink-swell potential. Unless limed, it is very strongly acid through medium acid.

This soil is mostly in woodland. Cleared areas are idle or are used for pasture. Only a few areas are used as cropland to grow hay. A very small acreage is used for community development.

This soil has poor potential for community development. It is limited mainly by its susceptibility to flooding and wetness. This soil is difficult to excavate because water inundates the excavations. The steep slopes of

excavations are unstable. This soil has poor potential for waste disposal systems, such as septic tank absorption fields, because of the seasonal high water table and the hazard of flooding. In addition, the septic system may pollute the ground water. In places, this soil is subject to ponding for several weeks in winter. This soil is poorly suited as homesites because it is flooded frequently. It is poorly suited to landscaping because sediment is often deposited by floodwaters. Many plants do not adapt to the wetness.

This soil is not well suited to crops. Wetness and flooding are the major limitations. Drainage is needed for good crop production. Even with drainage, this soil remains wet for several days after a heavy rain, restricting the use of many kinds of farming equipment. Crops may be damaged or lost if this soil is flooded during the growing season. Runoff and erosion are easy to control with simple conservation measures.

This soil is suited to trees. It has moderate productivity. This soil is limited mainly by wetness. Wetness or flooding may restrict the use of equipment during the wetter parts of the year. Seedling mortality is high, and windthrow is common because the high water table restricts the rooting depth. Machine planting is feasible when the soil is not wet. Trees to favor in existing woodlots are eastern white pine and red maple. Trees to plant in open areas are eastern white pine and white spruce.

The included Ninigret soils have greater potential for community development than this Rumney soil. The Podunk, Walpole, and Palms soils have poor potential because of a seasonal high water table much of the year. The Podunk soils flood frequently, and the Palms soils have 16 to 50 inches of organic material on the surface. Capability subclass IIIw; woodland suitability subclass 4w.

Rv—Rumney Variant silt loam. This nearly level, poorly drained soil is on the lower flood plains of the major streams and their tributaries. Slopes are 0 to 3 percent and are smooth and mostly 50 to 200 feet long. The areas are dominantly long and narrow in shape. They are mostly 3 to 50 acres in size.

Typically, this soil has a 2 inch layer of decomposed and partially decomposed litter on the surface. The surface layer is dark brown silt loam 9 inches thick. The subsoil, which is 22 inches thick, is reddish brown and dark reddish brown, mottled silt loam. The substratum, to a depth of 60 inches, is gray loamy sand and fine sand.

Included with this soil in mapping are small intermingled areas, generally less than 1 acre in size, of the moderately well drained Ellington and Podunk Variant soils, the poorly drained Raypol soils, and the very poorly drained Palms soil. In a few small areas the soils have a fine sandy loam surface layer and subsoil, and in other small areas they are deeper than 40 inches to sand or sand and gravel. Included areas make up 5 to 15 percent of this map unit.

This soil has a seasonal high water table at a depth of about 8 inches from late fall until mid-spring. It is subject to frequent flooding, mainly from fall through spring. Permeability is moderate in the surface layer and subsoil and rapid or very rapid in the substratum. This soil has a high available water capacity. Runoff is slow. This soil dries out and warms up slowly in spring. It has a low shrink-swell potential. Unless limed, it is strongly acid through slightly acid.

This soil is mostly in woodland, or it is cleared and idle. A few small areas are used for pasture or to grow hay. Only a small acreage is used for community development, mainly industrial parks.

This soil has poor potential for community development. It is limited mainly by its hazard of flooding and the seasonal high water table. This soil is difficult to excavate because the water table inundates excavations. The steep slopes of excavations are unstable. This soil has poor potential for waste disposal systems, such as septic tank absorption fields, because of the seasonal high water table and the hazard of flooding. In addition, the septic system may pollute the ground water. In many places, this soil is subject to ponding for several weeks in winter. This soil is poorly suited as homesites because of flooding and the seasonal high water table. It is poorly suited to landscaping because of wetness and because sediment is often deposited by the floodwaters.

This soil is not well suited to crops. Wetness and flooding are the major limiting factors for crops. Drainage is needed for good crop production. Even with drainage, this soil remains wet for several days after a heavy rain, restricting the use of many kinds of farming equipment. Runoff and erosion are easy to control with simple conservation measures.

This soil is suited to trees. It has moderate productivity. This soil is limited mainly by wetness. Wetness or flooding may restrict the use of equipment during the wetter parts of the year. Seedling mortality is high, and windthrow is common because the seasonal high water table restricts the rooting depth. Machine planting is feasible when the soil is not wet. Trees to favor in existing woodlots are eastern white pine and red maple. Trees to plant in open areas are eastern white pine, eastern hemlock, and Atlantic white cedar.

The included Ellington soils have greater potential for community development than the Rumney Variant. The Podunk Variant, Raypol, and Palms soils have poor potential for community development because of the seasonal high water table. The Podunk Variant soils flood frequently, and the Palms soils have a layer of organic material 16 to 50 inches thick on the surface. Capability subclass IIIw; woodland suitability subclass 4w.

Sc—Saco silt loam. This nearly level, very poorly drained soil is on low flood plains of the major streams. Slopes are 0 to 3 percent. They are smooth and generally are 50 to 200 feet long. The areas dominantly are long

and narrow in shape. They are mostly 3 to 75 acres in size.

Typically, the surface layer is very dark gray, mottled silt loam 8 inches thick. The substratum, to a depth of 60 inches, is dark gray, mottled silt loam and very fine sandy loam in the upper part over very dark gray silt loam and stratified sand and gravel. This soil has a thinner surface layer than Saco soils in other survey areas, but this does not affect use and management.

Included with this soil in mapping are small intermingled areas, generally less than 1 acre in size, of poorly drained Rumney and Raynham soils and very poorly drained Adrian and Palms soils. In many areas, the soils are less than 40 inches deep to sand or sand and gravel. In a few small areas, the surface layer and the upper part of the substratum are fine sandy loam. Included areas make up 5 to 25 percent of this map unit.

This soil has a high water table at or near the surface most of the year. It is subject to frequent flooding. It has moderate permeability above a depth of 40 inches and moderate to rapid permeability below that. This soil has a high available water capacity. Runoff is very slow. The shrink-swell potential is low. Unless limed, this soil is strongly acid to slightly acid in the upper part and medium acid to neutral in the lower part.

This soil is mostly in woodland. Only a few areas are cleared and are idle or used for pasture. A few small areas are filled and used for community development.

This soil has poor potential for community development. It is limited mainly by a high water table and frequent flooding. This soil is difficult to excavate because of the high water table. It is generally not feasible to install waste disposal systems, such as septic tank absorption fields, because of flooding and wetness. This soil provides poor and dangerous sites for houses because of the flooding hazard and wetness. It is poorly suited to landscaping because many plants cannot adapt to the wetness and frequent flooding.

This soil is poorly suited to crops because of wetness and the flooding hazard. In most places it is difficult to adequately drain this soil for crop production. Frequent flooding may severely damage or destroy an entire crop. Wetness restricts the use of most kinds of farming equipment.

This soil is unsuited for commercial timber production because of its wetness and the frequent flooding.

The included soils also have poor potential for community development because they have a high water table much of the year. In addition, the Rumney soils are subject to frequent flooding, and the Adrian and Palms soils have an organic layer 16 to 50 inches thick at the surface. Capability subclass VIw; woodland suitability subclass not assigned.

Sr—Scarboro muck. This nearly level, very poorly drained soil is in depressional areas of broad outwash terraces and narrow stream valleys. Slopes are 0 to 2 percent. They are smooth and mostly less than 300 feet long. The areas are dominantly irregular or long and narrow in shape. They are mostly 3 to 40 acres in size.

Typically, this soil has a 12 inch layer of black muck over the mineral surface layer. The surface layer is very dark gray loamy sand 5 inches thick. The substratum, to a depth of 60 inches, is gray fine sand over grayish brown, mottled sand.

Included with this soil in mapping are small intermingled areas, generally less than 1 acre in size, of poorly drained Walpole, Leicester, and Rumney soils and very poorly drained Adrian soils. In a few small areas the surface layer is sandy loam. Included areas make up 5 to 15 percent of this map unit.

This soil has a water table at or near the surface most of the year, especially from fall through spring and after heavy rains in summer. Permeability is rapid or very rapid. This soil has a low available water capacity. Runoff is very slow. This soil is commonly ponded in places for several weeks in winter. It has a low shrink-swell potential. Unless limed, it is very strongly acid through medium acid.

This soil is mostly in woodland. A few small areas are cleared and are idle or are used for pasture. A small acreage is used for community development and industrial parks.

This soil has poor potential for community development because of the high water table most of the year. It is difficult to excavate because water inundates the excavations. The steep slopes of excavations are unstable. This soil has poor potential for waste disposal systems, such as septic tank absorption fields, because of the high water table. Septic systems are not feasible without very extensive filling and engineering design, and they may pollute the ground water. Homesites on this soil are wet and require extensive filling. This soil is poorly suited to landscaping because of the wetness and organic material on the surface.

This soil is poorly suited to use as cropland. Wetness is the major limiting factor for crops. Adequate drainage for good crop production is difficult and generally not feasible. This soil may be ponded for several weeks in winter and for shorter periods after heavy rains in summer.

This soil is poorly suited to trees; however, woodland may be one of its best uses. Productivity is low. There are major limitations to the use of equipment, seedling mortality is high, and tree windthrow is common—all because of the high water table. Trees to favor in existing woodlots are eastern white pine and red maple. Trees to plant are northern white-cedar.

The included Walpole, Leicester, and Rumney soils have poor potential for community development; however, they do not have so high a water table for so long a period of the year as this Scarboro soil. The Rumney soils are also subject to frequent flooding. The Adrian soils have poor potential for community development

because they have 16 to 50 inches of organic material on the surface and a high water table that is at or near the surface most of the year. Capability subclass Vw; woodland suitability subclass 5w.

Ss—Scio silt loam. This nearly level, moderately well drained soil is in slight depressions of broad outwash terraces and narrow stream valleys. Slopes are smooth and are less than 3 percent. They are mainly less than 250 feet long. Areas are dominantly irregular in shape. They are mostly 3 to 25 acres in size.

Typically, the surface layer is dark brown silt loam 8 inches thick. The subsoil, which is 14 inches thick, is dark brown silt loam; it is mottled in the lower part. The substratum is brown very fine sandy loam and loamy very fine sand to a depth of 60 inches.

Included with this soil in mapping are small intermingled areas, generally less than 1 acre in size, of well drained Branford and Haven soils, moderately well drained Ellington soils, and poorly drained Raynham soils. Included areas make up 5 to 15 percent of this map unit.

This soil has a seasonal high water table at a depth of about 20 inches from late fall until mid-spring. Permeability is moderate above a depth of 40 inches and ranges from rapid to slow below a depth of 40 inches. This soil has a high available water capacity. Runoff is slow. This soil dries out and warms up slowly in spring. It has a low shrink-swell potential. Unless limed, this soil is very strongly acid through medium acid in the surface layer and subsoil and strongly acid through slightly acid in the substratum.

This soil is mainly used for cropland to grow hay, corn, and vegetables. A few areas are idle or are in woodland. A small but increasing acreage is used for community development.

This soil has fair to poor potential for community development. It is easy to excavate; however, the steep slopes of excavations are unstable. This soil has poor potential for waste disposal systems, such as septic tank absorption fields, because of the seasonal high water table. Furthermore, the septic system may pollute the ground water. Foundations and basements need to be properly designed and constructed to insure a stable foundation and to prevent wet basements. This soil is sometimes difficult to drain. During periods of construction, conservation measures are needed to prevent excessive runoff, erosion, and siltation.

This soil is well suited to crops. Wetness is the major limiting factor for crops. Drainage is generally needed for best crop production. Even with drainage, this soil remains wet for several days after a heavy rain, restricting the use of many kinds of farming equipment. Runoff and erosion are easy to control with simple conservation measures, such as the use of cover crops during winter.

This soil is well suited to trees. It has no major limitations for growing or harvesting trees. Productivity is moderately high. Machine planting is feasible in open areas. Wetness may restrict the use of some equipment during the wetter parts of the year. Trees to favor in existing woodlots are eastern white pine, white ash, northern red oak, and sugar maple. Trees to plant in open areas are eastern white pine, European larch, and white spruce.

The included Branford and Haven soils have greater potential for community development than this Scio soil. The Ellington soils have a potential similar to that of this Scio soil, but they are underlain by sand and gravel at a depth of 18 to 40 inches. The included Raynham soils are more poorly suited to community development because they have a higher seasonal water table for a longer period during the year. Capability subclass IIw; woodland suitability subclass 3o.

SvA—Sutton fine sandy loam, 0 to 3 percent slopes. This nearly level, moderately well drained soil is in slight depressions on glacial till plains and near the base of slopes on glacial uplands where the relief is affected by the underlying bedrock. Slopes are smooth and mostly concave. They are generally 100 to 300 feet long. The areas are dominantly irregular in shape and are mostly 3 to 20 acres in size.

Typically, the surface layer is dark brown fine sandy loam 8 inches thick. The subsoil is dark brown and yellowish brown, mottled fine sandy loam 20 inches thick. The substratum, to a depth of 60 inches, is brown and light olive brown fine sandy loam and gravelly fine sandy loam that has a few firm lenses up to 4 inches thick.

Included with this soil in mapping are small intermingled areas, generally less than 1 acre in size, of well drained Charlton soils, moderately well drained Woodbridge and Ninigret soils, and poorly drained Leicester soils. In a few areas, stones and boulders cover up to 3 percent of the surface. Included areas make up 5 to 15 percent of this map unit.

This soil has a seasonal high water table at a depth of about 20 inches from late in fall until mid-spring. Permeability is moderate or moderately rapid. The available water capacity is high. Runoff is slow. This soil tends to dry out and warm up rather slowly in spring. It has a low shrink-swell potential. In areas that are not limed, this soil is very strongly acid through medium acid.

Most of this soil is used for hay and corn. A few areas are used to grow vegetables and nursery stock. A significant and rapidly increasing acreage is in community developments or is idle. Some acreage is woodland and pasture.

This soil has fair potential for community development. It is fairly easy to excavate but in many places has stones and boulders. The seasonal high water table frequently inundates excavations. Particular attention needs to be given to houses with basements because the basements are generally below the depth of the water table. This results in wet basements unless the houses

are properly constructed. A few areas are subject to ponding for short periods in winter. Waste disposal systems such as onsite septic systems will generally not function satisfactorily with only normal design and installation because of the seasonal high water table. Very careful and often costly design and installation are required to insure that onsite septic systems function satisfactorily and that they are not flooded by the seasonal high water table. This soil is well suited to landscaping, but it may remain wet and soggy for several days after heavy rains. During construction of community developments, conservation measures are needed to prevent excessive runoff, erosion, and siltation.

This soil is well suited to cultivated crops. Tilth is good and is easy to maintain. Erosion is easy to control. Wetness is the major limiting factor in growing most crops, and drainage and maintaining good fertility are needed for best crop production. Stones and boulders near the surface are an annoyance when using some tillage equipment.

This soil is well suited to trees. Most areas of this soil were cropland at one time. Small areas have grown back to woodland. Productivity is moderate. Machine planting is practical in open areas. Trees to favor in existing woodlots are eastern white pine, sugar maple, northern red oak, and black cherry. Trees to plant in open areas are eastern white pine, European larch, white spruce, and Norway spruce.

The included Charlton soils are better suited to community development than the Sutton soil. The included Woodbridge and Ninigret soils are similarly suited; they are limited mainly by a seasonal high water table, and in addition the Woodbridge soils have a slowly permeable substratum. The Leicester soils are more poorly suited to community development because they have a higher water table for a longer period during the year. Capability subclass IIw; woodland suitability subclass 4o.

SvB—Sutton fine sandy loam, 3 to 8 percent slopes. This gently sloping, moderately well drained soil is in slight depressions on glacial till plains and near the base of slopes on glacial uplands where the relief is affected by the underlying bedrock. Slopes are smooth and mostly concave. They are mostly 100 to 400 feet long. The areas are dominantly irregular in shape and are mostly 3 to 25 acres in size.

Typically, the surface layer is dark brown fine sandy loam 8 inches thick. The subsoil is dark brown and yellowish brown, mottled fine sandy loam 20 inches thick. The substratum, to a depth of 60 inches, is brown and light olive brown fine sandy loam and gravelly fine sandy loam that has a few firm lenses up to 4 inches thick.

Included with this soil in mapping are small intermingled areas, generally less than 1 acre in size, of well drained Charlton soils, moderately well drained Woodbridge and Ninigret soils, and poorly drained Leicester soils. In a few areas, stones and boulders cover up to 3 percent of the surface. Included areas make up 5 to 15 percent of this map unit.

This soil has a seasonal high water table at a depth of about 20 inches from late in fall until mid-spring. Permeability is moderate or moderately rapid. The available water capacity is high. Runoff is medium. This soil tends to dry out and warm up slowly in spring. It has a low shrink-swell potential. In areas that are not limed, this soil is very strongly acid through medium acid.

Most of this soil is used for hay and corn. A few areas are used to grow vegetables, nursery stock, and orchards. A significant and rapidly increasing acreage is in community development. Some areas are idle. The rest is used as woodland and for pasture.

This soil has fair potential for community development. It is fairly easy to excavate but in many places has stones and boulders. The seasonal high water table frequently inundates excavations. Particular attention needs to be given to houses with basements because the basements are generally below the depth of the water table. This results in wet basements, unless the houses are properly constructed. Waste disposal systems, such as an onsite septic system, will generally not function satisfactorily with only normal design and installation because of the seasonal high water table. Very careful and often costly design and installation are required to insure that the septic systems function satisfactorily and are not flooded by the water table. This soil is well suited to landscaping, but it remains wet and soggy for several days after heavy rains. During construction of community developments, conservation measures are needed to prevent excessive runoff, erosion, and siltation.

This soil is well suited to cultivated crops. Tilth is good and is easy to maintain. Wetness is the major limiting factor in growing most crops, and drainage is needed for best crop production. The hazard of erosion is moderate, and controlling runoff and erosion is a concern in managing this soil. Maintaining good fertility is also a concern. If this soil is cultivated, drainage, minimum tillage, use of cover crops, and the use of grasses and legumes in the cropping system can help to reduce runoff and control erosion. Stones and boulders near the surface are an annoyance when using some tillage equipment.

This soil is well suited to trees. Most of this soil was cropland at one time. Small areas have grown back to woodland. Productivity is moderate. Machine planting is practical in open areas. Trees to favor in existing woodlots are eastern white pine, sugar maple, northern red oak, and black cherry. Trees to plant in open areas are eastern white pine, European larch, white spruce, and Norway spruce.

The included Charlton soils are better suited to most community developments than this Sutton soil. The included Woodbridge and Ninigret soils are similarly suited to community development. They are limited mainly by a seasonal high water table at a depth of about 20 inches;

the Woodbridge soils have a slowly permeable substratum. The Leicester soils are more poorly suited to community development because they have a higher water table for a longer period during the year. Capability subclass IIw; woodland suitability subclass 4o.

SxC—Sutton extremely stony fine sandy loam, 3 to 15 percent slopes. This gently sloping and sloping, moderately well drained soil is in slight depressions on glacial till plains and near the base of slopes on glacial uplands where the relief is affected by the underlying bedrock. In most places this soil has slopes of less than 8 percent. It has 3 to 25 percent of the surface covered with stones and boulders. Slopes are mostly smooth and concave. They are generally 100 to 400 feet long. The areas are dominantly irregular in shape and are mostly 3 to 25 acres in size.

Typically, the surface layer is very dark grayish brown fine sandy loam 6 inches thick. The subsoil is dark brown and yellowish brown, mottled fine sandy loam 22 inches thick. The substratum, described to a depth of 60 inches, is brown and light olive brown fine sandy loam and gravelly fine sandy loam with a few firm lenses up to 4 inches thick.

Included with this soil in mapping are small intermingled areas, generally less than 1 acre in size, of well drained Charlton soils, moderately well drained Woodbridge and Ninigret soils, and poorly drained Leicester soils. A few small areas have fewer stones and boulders on the surface. The included areas make up 5 to 15 percent of this map unit.

This soil has a seasonal high water table at a depth of about 20 inches from late in fall until mid-spring. This soil has moderate or moderately rapid permeability. The available water capacity is high. Runoff is medium to rapid. This soil tends to dry out and warm up rather slowly in the spring. It has a low shrink-swell potential. In areas that are not limed, this soil is very strongly acid through medium acid.

Most areas of this soil are woodland. A small acreage is cleared and used for pasture, or it is idle. A rapidly increasing acreage is being used for community developments.

This soil has fair potential for community development. It is limited mainly by its seasonal high water table and stoniness. This soil is fairly easy to excavate but in many places has stones and boulders below the surface as well as on the surface. The seasonal high water table frequently inundates excavations. Particular attention needs to be given to houses with basements because the basements are generally below the depth of the water table. This results in wet basements unless the soil is drained. A few areas are subject to ponding for short periods in winter. Waste disposal systems, such as onsite septic systems, generally will not function satisfactorily with only normal design and installation because of the seasonal high water table. Very careful and often costly design and installation are required to insure that onsite septic systems function satisfactorily and that they are not flooded by the water table. This soil is severely limited for landscaping because of its stoniness; however, large boulders are sometimes desired for their esthetic value and are left undisturbed. Removal of stones and boulders is costly. This soil may be soggy for several days after heavy rains. During construction of community developments, conservation measures are needed to prevent excessive runoff, erosion, and siltation.

This soil is poorly suited to use as cropland because of its stoniness. The stones and boulders generally are very costly to remove, and the use of modern farming equipment is not feasible without removing them. If cleared and used to grow crops, drainage is needed for good crop production. This soil has a moderate to severe erosion hazard and requires conservation measures such as permanent vegetation to control runoff and erosion.

This soil is suited to trees. Productivity is moderate. The stones and boulders somewhat hinder the use of some harvesting equipment and make machine planting generally not feasible. Trees to favor in existing woodlots are eastern white pine, sugar maple, northern red oak, and black cherry. Trees to plant in open areas are eastern white pine, European larch, white spruce, and Norway spruce.

The included Charlton soils are better suited to most community development than the Sutton soil. The included Woodbridge and Ninigret soils are similarly suited to community development. They are limited mainly by a seasonal high water table at a depth of 20 inches, and the Woodbridge soils have a slowly permeable substratum. The Leicester soils are more poorly suited to community development because they have a higher water table for a longer period during the year. Capability subclass VIIs; woodland suitability subclass 4x.

UD—Udorthents, smoothed. This map unit consists of a well drained to excessively drained soil. It is composed of cut or borrow areas, filled areas, and areas consisting of both cut and fill. These soils are mainly near urban areas. A small acreage is in the rural parts of the county. The slopes are mainly less than 15 percent; there are steep escarpments at the edges of some borrow areas and in a few urban developments. The areas are mostly rectangular or long and narrow and are mostly 10 to 200 acres in size.

The cut or borrow areas consist of places where the surface layer and the subsoil have been removed. In filled areas, more than 20 inches of soil material has been placed on the surface. In many places, the landscape has been smoothed, and the cut and fill areas occur in an intricate and complex pattern.

Included in mapping are areas up to 3 acres in size of undisturbed soils. Also included are areas up to 5 acres in size of buildings and parking lots. In places the texture

is sand or sand and gravel. Bedrock outcrops in a few areas. In a few places, the water table is at or near the surface.

The soil in this unit has a wide range of characteristics. Texture ranges mainly from sandy loam to silt loam or the gravelly analogs. Consistence ranges from loose to very firm. Permeability ranges from very rapid to slow.

This unit requires onsite investigation and evaluation for most uses because the characteristics of the soil are so variable. Capability subclass and woodland suitability subclass not assigned.

Ur—Urban land. This map unit consists mainly of areas that are covered by buildings, paved roads, and parking lots. Most of these areas are in the larger cities and the larger industrial and office complexes throughout the county. Slopes range from 0 to 25 percent but are dominantly 0 to 8 percent. The areas are mostly rectangular in shape and 5 to 500 acres in size.

Included in mapping are small intermingled areas, generally less than 2 acres in size, of Udorthents, smoothed, and small areas of undisturbed soils, mainly Cheshire, Charlton, Penwood, Branford, Agawam, Paxton, and Wethersfield soils.

This miscellaneous area requires onsite investigation and evaluation for most land use decisions. Capability subclass and woodland suitability subclass not assigned.

Wa—Walpole sandy loam. This nearly level, poorly drained soil is in depressions on broad outwash terraces and narrow stream valleys. Slopes are 0 to 3 percent. They are smooth and generally less than 200 feet long. The areas are dominantly irregular in shape and are mostly 3 to 45 acres in size.

Typically, the surface layer is very dark brown sandy loam 5 inches thick. The subsoil is 19 inches thick; it is grayish brown and light brownish gray, mottled sandy loam. The substratum, to a depth of 60 inches, is light olive brown stratified sand and gravel.

Included with this soil in mapping are small intermingled areas, generally less than 1 acre in size, of moderately well drained Ninigret and Ellington soils, poorly drained Raypol soils, and very poorly drained Scarboro soils. In a few small areas the surface layer is fine sandy loam. A few areas in the central part of the county have redder colors. Included areas make up 5 to 15 percent of this map unit.

From late in fall until mid-spring, this soil has a water table at a depth of about 8 inches. Permeability is moderately rapid in the surface layer and subsoil and rapid or very rapid in the substratum. The available water capacity is moderate. Runoff is slow. This soil dries out and warms up slowly in the spring. It has a low shrink-swell potential. If the soil is not limed, it is very strongly acid through medium acid.

Most areas of this soil have been cleared and are used to grow hay, corn, and pasture, or they are idle. A few areas are used to grow vegetables. Many areas are in woodland. An increasing acreage is being used for community development.

This soil has poor potential for community development. It is easy to excavate. Because of the high water table, excavations are inundated. Steep slopes of excavations are not stable if the soil is saturated. This soil has poor potential for waste disposal systems, such as an onsite septic system, because of the water table. Septic systems can pollute the ground water. In places this soil is subject to ponding for several weeks during the winter. Much attention needs to be given to properly designing and constructing foundations and basements to insure a stable foundation and prevent wet basements. This soil is poorly suited to landscaping because of its wetness. During construction of community developments, conservation measures are needed to prevent excessive siltation, erosion, and runoff.

This soil is not well suited to use as cropland. Wetness is the major limiting factor for crops, and drainage is needed for the best crop production. If drained, this soil may remain wet for several days after heavy rains, restricting the use of many kinds of farming equipment. Runoff and erosion are easy to control with simple conservation measures.

This soil is suited to trees. Productivity is moderate. Seedling mortality is high. Windthrow of the larger trees is common because the root zone for trees is shallow due to the high water table much of the year. Wetness restricts the use of some equipment during the wetter parts of the year; however, machine planting generally is feasible in open areas. Trees to favor in existing woodlots are eastern white pine and red maple. Trees to plant in open areas are eastern white pine, white spruce, northern white-cedar, and Norway spruce.

The included Ninigret and Ellington soils have greater potential for community development than the Walpole soil because they do not have as high a seasonal water table. The Raypol soils are poorly suited to community development because they have a water table at a depth of about 8 inches from fall until mid-spring. The Scarboro soils are more poorly suited because they have a higher water table. Capability subclass IIIw; woodland suitability subclass 4w.

WcA—Watchaug fine sandy loam, 0 to 3 percent slopes. This nearly level, moderately well drained soil is in slight depressions on glacial uplands. Slopes are smooth and concave. They are generally 100 to 300 feet long. The areas are dominantly irregular in shape and are mostly 3 to 20 acres in size.

Typically, the surface layer of this soil is dark reddish brown fine sandy loam 8 inches thick. The subsoil is 16 inches thick. It is reddish brown and yellowish red fine sandy loam and is mottled in the lower 6 inches. The substratum, described to a depth of 60 inches, is reddish brown, mottled, friable, gravelly sandy loam with discontinuous firm lenses up to 2 inches thick.

Included with this soil in mapping are small intermingled areas, generally less than 1 acre in size, of well drained Cheshire soils, moderately well drained Ludlow soils, and poorly drained Wilbraham soils. Also included are areas where the surface layer is silt loam and a few areas where up to 3 percent of the surface is covered with stones and boulders. Included areas make up 5 to 15 percent of this map unit.

From late in fall until mid-spring, this soil has a water table at a depth of about 20 inches. It has moderate permeability. The available water capacity is high. Runoff is slow. Tilth is easy to maintain. This soil tends to dry out and warm up rather slowly in spring. It has a low shrink-swell potential. Unless limed, this soil is very strongly acid through medium acid in the solum and very strongly acid through slightly acid in the substratum.

Most areas of this soil have been cleared and are being farmed, or they are idle. Only a small acreage is woodland. A significant and rapidly increasing acreage is being used for community development.

This soil has fair potential for community development. It is fairly easy to excavate, but in many places it has stones and boulders. Because of the seasonal high water table, excavations are frequently inundated. Particular attention needs to be given to building houses that have a basement because basements generally are below the depth of the water table. A wet basement results unless the soil is drained. A few areas are subject to ponding for short periods in winter. Waste disposal systems, such as an onsite septic system, will generally not function satisfactorily with only normal design and installation because of the seasonal high water table. Very careful and often costly design and installation are required to insure that onsite septic systems function satisfactorily and are not flooded by the water table. This soil is well suited to landscaping but may remain wet and soggy for several days after heavy rains. During construction of community developments, conservation measures are needed to prevent excessive runoff, erosion, and siltation.

This soil is well suited to cultivated crops. It is easy to maintain in good tilth. Erosion is easy to control. Wetness is the major limiting factor in growing most crops; drainage and maintaining good fertility are needed for the best crop production. A few cobbles and stones occur in the plow layer and are an annoyance with some tillage equipment.

This soil is well suited to trees, but only a small acreage is woodland. Productivity is moderate. Machine planting is practical in open areas. Trees to favor in existing woodlots are eastern white pine and northern red oak. Trees to plant are eastern white pine and white spruce.

The included Cheshire soils are better suited to community development than the Watchaug soil. The included Ludlow soils have fair potential for community development and are limited mainly by a seasonal high water table at a depth of about 20 inches and by a slowly permeable substratum. Wilbraham soils are more poorly suited to community development because they have a higher water table for a longer period during the year. Capability subclass IIw; woodland suitability subclass 4o.

WcB—Watchaug fine sandy loam, 3 to 8 percent slopes. This gently sloping, moderately well drained soil is in slight depressions and near the base of slopes of glacial uplands. Slopes are smooth and concave. They generally are 100 to 400 feet long. The areas are dominantly irregular in shape. They are mostly 3 to 25 acres in size.

Typically, the surface layer of this soil is dark reddish brown fine sandy loam 8 inches thick. The subsoil is 16 inches thick; it is reddish brown and yellowish red fine sandy loam and is mottled in the lower 6 inches. The substratum, described to a depth of 60 inches, is reddish brown, mottled, friable, gravelly sandy loam with discontinuous firm lenses up to 2 inches thick.

Included with this soil in mapping are small intermingled areas, generally less than 1 acre in size, of well drained Cheshire soils, moderately well drained Ludlow soils, and poorly drained Wilbraham soils. Also included are areas where the surface layer is silt loam and a few areas where up to 3 percent of the surface is covered with stones and boulders. Included areas make up 5 to 15 percent of this map unit.

This soil has a seasonal high water table at a depth of about 20 inches from late in fall until mid-spring. This soil has moderate permeability. It has a high available water capacity. Runoff is medium. Tilth is easy to maintain. This soil tends to dry out and warm up rather slowly in spring. It has a low shrink-swell potential. If it is not limed, this soil is very strongly acid through medium acid in the solum and very strongly acid through slightly acid in the substratum.

Most areas of this soil have been cleared and are being farmed, or they are idle. Only a small acreage is in woodland. A significant and rapidly increasing acreage is being used for community development.

This soil has fair potential for community development. It is fairly easy to excavate but has stones and boulders in many places. The seasonal high water table frequently inundates excavations. Particular attention needs to be given to building homes with basements because the basements are usually below the depth of the seasonal high water table. This results in wet basements, unless the soil is drained. Waste disposal systems, such as an onsite septic system, will generally not function satisfactorily with only normal design and installation because of the seasonal high water table. Very careful and often costly design and installation are required to insure that onsite septic systems function satisfactorily and are not flooded by the water table. This soil is well suited to landscaping, but it may remain wet and soggy for several days after heavy rains. During construction of community

developments, conservation measures are needed to prevent excessive runoff, erosion, and siltation.

This soil is well suited to cultivated crops. It is easy to maintain in good tilth. Wetness is the major limiting factor in growing most crops, and drainage is needed for best crop production. The hazard of erosion is moderate, and controlling runoff and erosion is a concern in managing this soil. If this soil is cultivated, minimum tillage, use of cover crops, and including grasses and legumes in the cropping system are practices that help to reduce runoff and control erosion. A few cobbles and stones occur in the plow layer and are an annoyance when using some tillage equipment.

This soil is well suited to trees, but only a small acreage is in woodland. Productivity is moderate. Machine planting is practical in open areas. Trees to favor in existing woodlots are eastern white pine and northern red oak. Trees to plant are eastern white pine and white spruce.

The included Cheshire soils are better suited to community development than this Watchaug soil. The included Ludlow soils have fair potential for community development and are limited mainly by a seasonal high water table at a depth of about 20 inches and by a slowly permeable substratum. Wilbraham soils are more poorly suited to community development because they have a higher water table for a longer period during the year. Capability subclass IIw; woodland suitability subclass 4o.

We—Westbrook mucky peat. This nearly level, very poorly drained organic soil is in tidal marshes along the coast of Long Island Sound. The organic layers are 16 to 51 inches thick over loamy mineral material. This soil has slopes up to 1 percent. The areas are mainly irregular in shape. They are mostly 3 to 200 acres in size.

Typically, the organic layer is 48 inches thick; it is very dark brown, very dark grayish brown, and very dark gray mucky peat. The substratum, described to a depth of 99 inches, is dark gray silt loam.

Included with this soil in mapping are small intermingled areas, generally less than 2 acres in size, of the very poorly drained Westbrook low-salt soils, Scarboro soils, and Saco soils and the poorly drained Rumney and Walpole soils. In a few small areas in Madison and Guilford, the organic layer is up to 60 inches thick. Included soils make up 5 to 10 percent of this map unit.

This soil has moderate to rapid permeability in the organic layers and moderate permeability in the substratum. The available water capacity is high. Runoff is very slow. This soil is subject to tidal flooding twice daily. The total salt content is more than 10,000 parts per million. This soil is strongly acid to neutral.

This soil is mostly in its natural condition; it has a salt marsh vegetation. Most areas have an open ditch drainage system that speeds the drainage of the tidal inundations from the marshes. A few small areas have been filled and are used for community development, mainly industrial parks.

This soil has poor potential for community development. It is subject to tidal flooding twice a day. If filled and used for building sites, the organic layers should be removed to prevent them from settling after the construction is completed. If these areas are not filled extensively, they may still be subject to flooding by storm tides.

This soil is not suited to crops or trees because of its wetness, daily flooding, and high salt content.

This soil provides food or habitat for fish, shellfish, and wildfowl. The most common grasses are salt meadowgrass, salt water grass, and spike grass. Other vegetation on this soil is blackgrass, sea lavender, saltwort, seaside goldenrod, aster, and purple garardi.

The included soils have poor potential for community development. They have a high water table much of the year. In most places, they are subject to flooding by frequent storm tides. In a few areas of these included soils, the vegetation is marsh elder, groundsel tree, switchgrass, and tall reeds and sedges. Capability subclass VIIIw; woodland suitability subclass not assigned.

Wh—Westbrook mucky peat, low salt. This nearly level, very poorly drained, organic soil is in tidal marshes in estuaries near the mouth of the larger rivers, mainly the Quinnipiac River. The organic layers are 16 to 51 inches thick over loamy mineral material. This soil has slopes of up to 1 percent. The areas are mainly irregular in shape. They are mostly 3 to 200 acres in size.

Typically, the organic layer is 48 inches thick. It is very dark brown, very dark grayish brown, and very dark gray mucky peat. The substratum, described to a depth of 60 inches, is dark gray silt loam.

Included with this soil in mapping are small intermingled areas, generally less than 2 acres in size, of the very poorly drained Westbrook, Scarboro, and Saco soils and the poorly drained Rumney Variant and Walpole soils. In a few areas, the organic layer is up to 70 inches thick. Included areas make up 5 to 15 percent of this map unit.

This soil has moderate to rapid permeability in the organic layers and moderate permeability in the substratum. The available water capacity is high. Runoff is very slow. This soil is subject to tidal flooding twice daily; however, flooding has been reduced in places by highways and railroads crossing this soil. The total salt content of this soil ranges from 1,000 to 10,000 parts per million. This soil is strongly acid to neutral in its natural condition.

This soil is mostly in its natural marsh condition. Most areas have an open ditch drainage system that speeds the drainage of tidal inundations from the marshes. A few areas have been filled and are used as industrial parks and sanitary landfills.

This soil has poor potential for community development. It is subject to tidal flooding daily. If the areas are filled and used as building sites, the organic layers should be removed to prevent settling after the construction is completed. If these areas are not filled extensively, they may still be subject to tidal flooding by storm tides.

This soil is not suited to crops or trees because of its high salt content and the daily flooding by storm tides.

This soil provides food or habitat for wildfowl, fish, and shellfish. Vegetation differs from Westbrook mucky peat in that it consists mainly of tall reeds, sedges, switchgrass, and a few marsh elders. The tall reeds and sedges are sometimes a fire hazard in the fall and spring.

The included soils have poor potential for community development. They have a high water table much of the year. In most places they are subject to flooding by frequent storm tides. Capability subclass VIIIw; woodland suitability subclass not assigned.

WkB—Wethersfield loam, 3 to 8 percent slopes. This gently sloping, well drained soil is on the top of drumlins, hills, and ridges on glacial uplands. Slopes are smooth and convex and generally are 100 to 500 feet long. The areas are dominantly oval or irregular in shape and are mostly 5 to 45 acres in size.

Typically, if the soil has been plowed, the surface layer is dark brown loam 8 inches thick. The subsoil is reddish brown loam 17 inches thick. The substratum, described to a depth of 60 inches, is reddish brown, very firm fine sandy loam.

Included with this soil in mapping are small intermingled areas, generally less than 1 acre in size, of moderately well drained Ludlow soils, well drained Cheshire and Yalesville soils, and somewhat excessively drained Holyoke soils. In a few areas, slopes are less than 3 percent. In places, the surface layer is silt loam or fine sandy loam. Included areas make up 5 to 15 percent of this map unit.

Permeability is moderate in the surface layer and subsoil and slow or very slow in the substratum. The available water capacity is moderate. Runoff is medium. This soil tends to dry out and warm up rather slowly in the spring. It has a low shrink-swell potential. In areas that are not limed, this soil is very strongly acid or strongly acid in the surface layer and subsoil and very strongly acid to medium acid in the substratum.

In most areas, this soil is used for hay and corn. A few areas are used to grow vegetables, nursery stock, and fruit orchards. A significant and rapidly increasing acreage is in community development. Some areas are idle. Some acreage is woodland.

This soil has fair potential for community development. It is fairly easy to excavate, but the substratum is very firm and commonly contains stones and boulders. Waste disposal systems, such as onsite septic systems, will generally not function satisfactorily with only normal design and installation because of the slowly or very slowly permeable substratum. Very careful design and installation are required to insure a satisfactory system. This soil is well suited to landscaping. During construction of community developments, conservation measures are needed to prevent excessive runoff, erosion, and siltation.

This soil is well suited to cultivated crops. Good tilth is easy to maintain. The hazard of erosion is moderate. Controlling runoff and erosion and maintaining good fertility and organic matter content are major concerns in managing this soil. If this soil is cultivated, minimum tillage, use of cover crops, and including grasses and legumes in the cropping system can help to reduce runoff and control erosion. Stones and boulders near the surface are an annoyance in using some tillage equipment.

This soil is well suited to trees. Most areas were cropland at one time. A few areas have grown back to woodland. Productivity is moderately high. Machine planting is practical in open areas. Trees to favor in existing woodlots are eastern white pine, sugar maple, northern red oak, and yellow-poplar. Trees to plant in open areas are eastern white pine.

The included Cheshire soils have good potential for community development. The Yalesville soils have fair potential because they have bedrock at a depth of 20 to 40 inches. The Ludlow and Holyoke soils have poor potential for onsite septic systems; the Ludlow soils have a slowly or very slowly permeable substratum and a seasonal high water table at a depth of about 20 inches, and the Holyoke soils have bedrock at a depth of 10 to 20 inches. Capability subclass IIe; woodland suitability subclass 3o.

WkC—Wethersfield loam, 8 to 15 percent slopes. This sloping, moderately well drained soil is on side slopes of drumlins, ridges, and hills on glacial uplands. Slopes are smooth and convex and generally are 100 to 500 feet long. The areas are dominantly oval or long and narrow in shape. They are mostly 5 to 45 acres in size.

Typically, if the soil has been plowed, the surface layer is dark brown loam 8 inches thick. The subsoil is reddish brown loam 17 inches thick. The substratum, described to a depth of 60 inches, is reddish brown, very firm fine sandy loam.

Included with this soil in mapping are small intermingled areas, generally less than 1 acre in size, of moderately well drained Ludlow soils, well drained Cheshire and Yalesville soils, and somewhat excessively drained Holyoke soils. A few areas have a silt loam or fine sandy loam surface layer. Included areas make up 5 to 15 percent of this map unit.

Permeability is moderate in the surface layer and subsoil and slow or very slow in the substratum. The available water capacity is moderate. Runoff is rapid. This soil

tends to dry out and warm up rather slowly in the spring. It has a low shrink-swell potential. In areas that are not limed, this soil is very strongly acid or strongly acid in the surface layer and subsoil and very strongly acid through medium acid in the substratum.

In most areas, this soil is used for hay and corn. A few areas are in fruit orchards. A significant and rapidly increasing acreage is idle or is in community development. Some acreage is woodland.

This soil has fair potential for community development. It is limited mainly by the slow or very slow permeability of the substratum and by the steepness of slopes. The steeper slopes add to the expense of building roads, installing sewer and water lines, building homes, and designing and installing onsite septic systems. This soil is fairly easy to excavate, but the substratum is very firm and commonly contains stones and boulders. Waste disposal systems, such as onsite septic systems, will generally not function satisfactorily without very careful design and installation because of the slowly or very slowly permeable substratum. Caution needs to be taken to insure that effluent does not seep to the surface downslope from the disposal system. Landscaping is limited mainly by the steepness of slopes. Rather intensive conservation measures are needed to prevent excessive runoff, erosion, and siltation during construction of community developments.

This soil is suited to use as cropland; however, it has a severe erosion hazard. Controlling runoff and erosion is a major management concern if this soil is cultivated. Minimum tillage, use of cover crops, stripcropping, and including grasses and legumes in the cropping system can help to reduce runoff and erosion. Good tilth is easy to maintain.

This soil is well suited to trees. Most areas of this soil were cropland at one time, but a few areas have reverted to woodland. Productivity is moderately high. Machine planting is practical in open areas. Trees to favor in existing woodlots are eastern white pine, sugar maple, northern red oak, and yellow-poplar. Trees to plant in open areas are eastern white pine.

The included Cheshire soils have better potential for onsite septic systems than this Wethersfield soil. The Ludlow and Yalesville soils have fair potential for community development: Ludlow soils because of a seasonal water table at a depth of about 20 inches and a slowly permeable substratum and Yalesville soils because of bedrock at a depth of 20 to 40 inches. The Holyoke soils are poorly suited to community development because of bedrock at a depth of 10 to 20 inches. Capability subclass IIIe; woodland suitability subclass 3o.

WkD—Wethersfield loam, 15 to 25 percent slopes. This moderately steep, well drained soil is on the sides of drumlins, hills, and ridges on glacial uplands. Slopes are smooth and convex and generally are 100 to 500 feet long. The areas are dominantly long and narrow or oval in shape and mostly 5 to 50 acres in size.

Typically, where the soil has been plowed, the surface layer is dark brown loam 8 inches thick. The subsoil is reddish brown loam 15 inches thick. The substratum, described to a depth of 60 inches, is reddish brown, very firm fine sandy loam.

Included with this soil in mapping are small intermingled areas, generally less than 1 acre in size, of well drained Cheshire and Yalesville soils and somewhat excessively drained Holyoke soils. In a few areas, up to 15 acres in size, as much as 3 percent of the surface is covered with stones and boulders. In a few areas, the surface layer is silt loam or fine sandy loam. Included areas make up 5 to 15 percent of this map unit.

Permeability is moderate in the surface layer and subsoil and slow or very slow in the substratum. The available water capacity is moderate. Runoff is rapid. This soil tends to dry out and warm up slowly in the spring. It has a low shrink-swell potential. In areas that are not limed, it is very strongly acid or strongly acid in the surface layer and subsoil and very strongly acid through medium acid in the substratum.

Most areas of this soil are used for hay or pasture or are idle. A few areas have reverted to woodland. A significant and increasing acreage is in community development. A few small areas are in fruit orchards.

This soil has poor potential for community development. It is limited mainly by the steepness of slopes and by the slowly permeable substratum. Building houses and roads and installing onsite septic systems and water and sewer lines are more expensive on this soil than on less sloping soils. This soil is fairly easy to excavate, but the substratum is very firm, and in many places it has stones and boulders. Waste disposal systems, such as onsite septic systems, will generally not function satisfactorily without very careful design and installation because of the slowly permeable substratum. Care needs to be taken to insure that effluent does not seep to the surface downslope from the disposal system. Intensive conservation measures are needed to prevent excessive runoff, erosion, and siltation during construction of community developments.

This soil is poorly suited to cultivated crops because of the steepness of slopes. It has a severe erosion hazard. A good vegetative cover should be maintained. Controlling runoff and erosion is the major concern in managing this soil for farming. The steepness of slopes is a hazard to the safe operation of most farm equipment, and safety precautions must be exercised when operating equipment on this soil.

This soil is suited to trees. Productivity is moderately high. Use of equipment is somewhat limited by the steepness of slope. Machine planting is practical in open areas, although hampered somewhat by slopes. Trees to favor in existing woodlots are eastern white pine, sugar

maple, northern red oak, and yellow-poplar. Trees to plant in open areas are eastern white pine.

The included soils have poor potential for onsite septic systems: Cheshire soils because of the steepness of slopes, Yalesville soils because of bedrock at a depth of 20 to 40 inches, and Holyoke soils because of bedrock at a depth of 10 to 20 inches. Capability subclass IVe; woodland suitability subclass 3r.

WmB—Wethersfield very stony loam, 3 to 8 percent slopes. This gently sloping, well drained soil is on the top of drumlins, hills, and ridges on glacial uplands. It has 0.1 to 3 percent of the surface covered with stones and boulders. Slopes are smooth and convex and are mainly 100 to 400 feet long. The areas are dominantly irregular or rectangular in shape and are mostly 5 to 35 acres in size.

Typically, the surface layer is dark brown fine sandy loam 6 inches thick. The subsoil is reddish brown loam 19 inches thick. The substratum, described to a depth of 60 inches, is reddish brown, very firm fine sandy loam.

Included with this soil in mapping are small intermingled areas, generally less than 1 acre in size, of the moderately well drained Ludlow soils, the well drained Charlton and Yalesville soils, and the somewhat excessively drained Holyoke soils. In a few areas, slopes are less than 3 percent. In a few areas, the surface layer is silt loam or fine sandy loam. Included areas make up 5 to 15 percent of this map unit.

Permeability is moderate in the surface layer and subsoil and slow or very slow in the substratum. The available water capacity is moderate. Runoff is medium. This soil tends to dry out and warm up slowly in the spring. It has a low shrink-swell potential. In areas that are not limed, this soil is very strongly acid through medium acid in the substratum.

Most areas of this soil have been cleared and were used for cropland or pasture. Many of the stones and smaller boulders were removed, leaving only the larger ones in most places. Most areas have now reverted to woodland or are idle. A small acreage is used for pasture, and a few areas are used to grow hay. A significant and rapidly increasing acreage is in community development.

This soil has fair potential for community development. It is fairly easy to excavate; however, the substratum is very firm, and there are stones and boulders in the soil as well as on the surface. Waste disposal systems, such as an onsite septic system, will generally not function satisfactorily with only normal design and installation because of the slowly or very slowly permeable substratum. Very careful design and installation are required to insure a satisfactory system. Surface stones and boulders can interfere with installation of the system, and they are a hindrance in landscaping. During construction of community developments, conservation measures are needed to prevent excessive runoff, erosion, and siltation.

This soil is poorly suited to cultivated crops because of its stoniness. If the stones and boulders are removed, it is well suited to cultivated crops, but removing stones is costly. This soil is suited to grasses and legumes, but the stones and boulders interfere with the use of harvesting equipment. This soil has a moderate erosion hazard, which is a major concern of management. If this soil is cultivated, conservation measures are required to prevent runoff and erosion.

This soil is well suited to trees. Productivity is moderately high. The stones and boulders are a slight hindrance in the use of harvesting and planting equipment, but machine planting is feasible in open areas. Trees to favor in existing woodlots are eastern white pine, sugar maple, northern red oak, and yellow-poplar. Trees to plant in open areas are eastern white pine.

The included Ludlow and Holyoke soils are not so well suited to community development as this Wethersfield soil. They have poor potential for onsite septic systems: the Woodbridge soils because of a seasonal high water table at a depth of about 20 inches and a slowly permeable substratum, and the Holyoke soils because of bedrock at a depth of 10 to 20 inches. The Cheshire soils have good potential for onsite septic systems. Capability subclass VIs; woodland suitability subclass 3o.

WmC—Wethersfield very stony loam, 8 to 15 percent slopes. This sloping, well drained soil is on side slopes of drumlins, ridges, and hills on glacial uplands. It has 0.1 to 3 percent of the surface covered with stones and boulders. Slopes are smooth and convex and mostly 100 to 400 feet long. The areas are dominantly irregular or rectangular in shape and are mostly 5 to 35 acres in size.

Typically, the surface layer is dark brown fine sandy loam 6 inches thick. The subsoil is reddish brown loam 19 inches thick. The substratum, described to a depth of 60 inches, is reddish brown, very firm fine sandy loam.

Included with this soil in mapping are small intermingled areas, generally less than an acre in size, of moderately well drained Ludlow soils, well drained Cheshire and Yalesville soils, and somewhat excessively drained Holyoke soils. In a few areas the surface layer is silt loam or fine sandy loam. Included areas make up 5 to 15 percent of this map unit.

Permeability is moderate in the surface layer and subsoil and slow or very slow in the substratum. The available water capacity is high. Runoff is rapid. This soil tends to dry out and warm up rather slowly in the spring. It has a low shrink-swell potential. In areas that are not limed, this soil is very strongly acid or strongly acid in the surface layer and subsoil and very strongly acid through medium acid in the substratum.

Most areas of this soil have been cleared and were used as cropland or pasture. Many of the stones and smaller boulders were removed, leaving only the larger ones in many places. Most areas have reverted to wood-

land or are idle. A small acreage is in community developments.

This soil has fair potential for community development. It is limited mainly by the steepness of slopes, the slowly permeable substratum, and stoniness. This soil is fairly easy to excavate; however, the substratum is very firm, and in many places there are stones and boulders in the soil as well as on the surface. Waste disposal systems, such as onsite septic systems, will generally not function satisfactorily with only normal design and installation. Very careful design and installation are required to insure that the system functions properly and effluent does not seep to the surface downslope. Stones and boulders may interfere with the installation of the septic system, and they hinder landscaping. Rather intensive conservation measures are needed to prevent excessive runoff, erosion, and siltation during periods of construction of community developments.

This soil is poorly suited to cultivated crops because of the stoniness. Stone removal is costly. This soil is suited to grasses and legumes, but the stones and boulders interfere with harvesting equipment. This soil has a severe erosion hazard, which is a major concern of management. If this soil is cultivated, intensive conservation measures are required to control runoff and erosion.

This soil is suited to trees. Productivity is moderately high. The stones and boulders hinder the use of harvesting and planting equipment, but machine planting is feasible in open areas. Trees to favor in existing stands are eastern white pine, sugar maple, northern red oak, and yellow-poplar. Trees to plant in open areas are eastern white pine.

The included Ludlow and Holyoke soils are not so well suited to community development as this Wethersfield soil. They have poor potential for onsite septic systems: Ludlow soils because of a seasonal high water table at a depth of about 20 inches and a slowly permeable substratum and Holyoke soils because of bedrock at a depth of 10 to 20 inches. The Cheshire soils have fair potential for onsite septic systems; they are limited mainly by the steepness of slopes and stoniness. The Yalesville soils have bedrock at a depth of 20 to 40 inches. Capability subclass VIs; woodland suitability subclass 3o.

WnC—Wethersfield extremely stony loam, 3 to 15 percent slopes. This gently sloping and sloping, well drained soil is on drumlins, ridges, and hills on glacial uplands. It has 3 to 25 percent of the surface covered with stones and boulders. Slopes are mostly smooth and convex and mainly 150 to 500 feet long. The areas are dominantly irregular or rectangular in shape and are mostly 5 to 60 acres in size.

Typically, the surface layer is dark brown fine sandy loam 2 inches thick. The subsoil is reddish brown loam 23 inches thick. The substratum, described to a depth of 60 inches, is reddish brown, very firm fine sandy loam.

Included with this soil in mapping are small intermingled areas, generally less than 1 acre in size, of moderately well drained Ludlow soils, well drained Cheshire and Yalesville soils, and somewhat excessively drained Holyoke soils. A few small areas have less than 3 percent of the surface covered with stones and boulders. In a few areas the surface layer is silt loam or fine sandy loam. The included areas make up 5 to 15 percent of this map unit.

This soil has moderate permeability in the surface layer and subsoil and slow or very slow permeability in the substratum. The available water capacity is moderate. Runoff is medium to rapid. This soil tends to dry out and warm up slowly in the spring. It has a low shrink-swell potential. In areas that are not limed, this soil is very strongly acid or strongly acid in the surface layer and very strongly acid through medium acid in the substratum.

Most of this soil is woodland. A small acreage is cleared and used for pasture, or it is idle. A rapidly increasing acreage is being used for community developments.

This soil has fair potential for community development. It is limited mainly by stoniness, the slowly permeable substratum, and, in places, the steepness of slopes. Removal of stones and boulders is costly. Waste disposal systems such as onsite septic systems, will generally not function satisfactorily with only normal design and installation. Very careful design and installation are required to insure that the system functions properly and effluent does not seep to the surface downslope from the system. Stones and boulders interfere with the installation of the system in many places. Stoniness severely limits this soil for landscaping, but large boulders are sometimes desired for their esthetic value and are left undisturbed. During construction of community developments, conservation measures are needed to prevent excessive runoff, erosion, and siltation.

This soil is poorly suited to cropland because of the stoniness. The stones and boulders are costly to remove, but the use of modern farming equipment is not feasible if they are not removed. This soil has a moderate to severe erosion hazard and requires conservation measures such as permanent vegetation to control runoff and erosion.

This soil is suited to trees. Productivity is moderately high. The stones and boulders hinder the use of some harvesting equipment and make machine planting generally not feasible. Trees to favor in existing woodlots are eastern white pine, sugar maple, northern red oak, and yellow-poplar. Trees to plant in open areas are eastern white pine.

The included Ludlow and Holyoke soils are not so well suited to community development as this soil—Ludlow soils because of a seasonal high water table at a depth of about 20 inches and a slowly permeable substratum, and Holyoke soils because of bedrock at a depth of 10

to 20 inches. The included Cheshire soils have fair potential for community development; they are limited mainly by stoniness and, in places, the steepness of slopes. The Yalesville soils have bedrock at a depth of 20 to 40 inches. Capability subclass VIIs; woodland suitability subclass 3x.

WnD—Wethersfield extremely stony loam, 15 to 35 percent slopes. This moderately steep and steep, well drained soil is on the sides of drumlins, ridges, and hills on glacial uplands. It has 3 to 25 percent of the surface covered with stones and boulders. Slopes are mostly smooth and convex and generally are 100 to 600 feet long. The areas are dominantly long and narrow or irregular in shape and are mostly 5 to 75 acres in size.

Typically, the surface layer is dark brown fine sandy loam 2 inches thick. The subsoil is reddish brown loam 22 inches thick. The substratum, described to a depth of 60 inches, is reddish brown, very firm sandy loam.

Included with this soil in mapping are small intermingled areas, generally less than 1 acre in size, of the somewhat excessively drained Holyoke soils and the well drained Cheshire and Yalesville soils. A few small areas have less than 3 percent of the surface covered with stones and boulders. In a few areas the surface layer is silt loam or fine sandy loam. Included areas make up 5 to 15 percent of this map unit.

This soil has moderate permeability in the surface layer and subsoil and slow or very slow permeability in the substratum. The available water capacity is moderate. Runoff is rapid. This soil tends to dry out and warm up rather slowly in the spring. It has a low shrink-swell potential. In areas that are not limed, it is very strongly acid or strongly acid in the surface layer and subsoil and very strongly acid through medium acid in the substratum.

Most of this soil is in woodland. Only a small acreage has been cleared and is used for pasture. Some cleared areas are idle. A small but increasing acreage is used for community developments.

This soil has poor potential for community developments, mainly because of the steepness of slopes, the slowly permeable substratum, and stoniness. Removing stones and boulders is costly. Waste disposal systems, such as an onsite septic system, will generally not function satisfactorily with only normal design and installation. Very careful and generally costly design and installation are required to insure that the system functions properly and effluent does not seep to the surface downslope; this is a severe problem on this soil and adds considerable expense to the cost of the disposal system. Landscaping is difficult because of stoniness and the steepness of slopes, but stones and boulders, especially large ones, are often desired because of their esthetic value and are left undisturbed. This soil provides a site for homes that are uniquely designed. During construction of community developments, intensive conservation measures are often needed to prevent excessive runoff and erosion. These measures may include temporary vegetation, diversions, and siltation basins.

This soil is poorly suited to crops because of its stoniness and the steepness of slopes. The stones and boulders are normally very costly to remove, and the use of modern farming equipment is not feasible if they are not removed.

This soil is suited to trees. Productivity is moderately high. The use of harvesting equipment is somewhat limited by the stoniness and the steepness of slopes. Machine planting generally is not feasible. Trees to favor in existing woodlots are eastern white pine, sugar maple, northern red oak, and yellow-poplar. Trees to plant in open areas are eastern white pine.

The included soils are also poorly suited to most community developments because of the steepness of slopes and stoniness. The Yalesville soils have bedrock at a depth of 20 to 40 inches. The Holyoke soils have bedrock at a depth of 10 to 20 inches. Capability subclass VIIs; woodland suitability subclass 3x.

Wr—Wilbraham silt loam. This nearly level, poorly drained soil is in drainageways and depressions on glacial uplands. Slopes range from 0 to 3 percent. They are smooth and concave, and most are 50 to 300 feet long. The areas are dominantly long and narrow or irregular in shape and are mostly 3 to 40 acres in size.

Typically, the surface layer of this soil is dark brown silt loam 8 inches thick. The subsoil is 17 inches thick. It is reddish brown, mottled silt loam. The substratum, described to a depth of 60 inches, is reddish brown, mottled, very firm loam.

Included with this soil in mapping are small intermingled areas, generally less than 1 acre in size, of moderately well drained Ludlow and Watchaug soils and very poorly drained Menlo soils. Also included are areas where the surface layer is loam or fine sandy loam. In a few areas, slopes are up to 6 percent. Included areas make up 5 to 15 percent of this map unit.

This soil has a seasonal high water table at a depth of about 8 inches from fall until midspring. During the summer, the water table may drop to a depth of 5 feet or more. This soil has moderate permeability in the surface layer and subsoil and slow or very slow permeability in the substratum. The available water capacity is moderate. Runoff is slow. This soil dries out and warms up slowly in spring. It remains wet for several days after heavy rains in the summer. It has a low shrink-swell potential. In areas that are not limed, this soil is very strongly acid or strongly acid in the surface layer and subsoil and strongly acid or medium acid in the substratum.

Most areas of this soil have been cleared and are idle or are used to grow hay and pasture. A small acreage has grown back to woodland. An increasing acreage is being used for community developments.

This soil has poor potential for community development. It is limited mainly by a seasonal high water table and the slowly or very slowly permeable substratum. This soil is difficult to excavate; because of the high water table, the excavations are inundated. Steep slopes of excavations tend to slump when the soil is saturated. The substratum is very firm and commonly has stones and boulders. This soil has poor potential for building foundations and basements because footings are placed below the depth of the high water table. Waste disposal systems, such as onsite septic systems, will not function satisfactorily without very unusual and costly design and installation because of the slowly permeable substratum and the high water table; even then they are subject to a high rate of failure. Many areas are subject to ponding during winter. This soil has poor potential for landscaping because of wetness. During the summer it remains wet for several days after rains, and it is frequently soggy and difficult to mow. Many plants do not adapt to the wet conditions of this soil. During construction of community developments, conservation measures are needed to prevent excessive siltation, runoff, and erosion.

This soil is fairly well suited to crops. Wetness is the major limitation for most crops, and drainage is needed for good crop production. Erosion is easy to control.

This soil is suited to trees. It is limited mainly by wetness. Productivity is moderate. The use of equipment is severely limited by wetness. When the soil is not wet, machine planting is practical in open areas. Seedling mortality is high. Because of the high water table, trees have a shallow rooting zone; as a result, tree windthrow is common. Trees to favor in existing woodlots are eastern white pine, sugar maple, red maple, and northern red oak. Trees to plant are eastern white pine and white spruce.

The included Ludlow soils have greater potential for community development than this Wilbraham soil because they have a lower seasonal high water table. The Menlo soils have less potential because they have a higher water table and are wet for longer periods during the year. Capability subclass IIIw; woodland suitability subclass 4w.

Ws—Wilbraham very stony silt loam. This nearly level, poorly drained soil is in drainageways and depressions on glacial uplands. It has 0.1 to 3 percent of the surface covered with stones and boulders. Slopes range from 0 to 3 percent, are smooth and concave, and are mostly 50 to 300 feet long. The areas are dominantly long and narrow or irregular in shape and are mostly 3 to 25 acres in size.

Typically, the surface layer of this soil is dark brown silt loam 6 inches thick. The subsoil is 19 inches thick. It is reddish brown, mottled silt loam. The substratum, described to a depth of 60 inches, is reddish brown, mottled, very firm loam.

Included with this soil in mapping are small intermingled areas, generally less than 1 acre in size, of moderately well drained Ludlow and Watchaug soils and very poorly drained Menlo soils. Also included are areas where the surface layer is loam or fine sandy loam. A few areas have slopes of up to 6 percent. Included areas make up 5 to 15 percent of this map unit.

In fall until mid-spring, this soil has a seasonal high water table at a depth of about 8 inches. During summer the water table may drop to a depth of 5 feet or more. This soil has moderate permeability in the surface layer and subsoil and slow or very slow permeability in the substratum. The available water capacity is moderate. Runoff is slow. This soil dries out and warms up slowly in the spring. It remains wet for several days after heavy rains in the summer. It has a low shrink-swell potential. In areas that are not limed, this soil is very strongly acid or strongly acid in the surface layer and subsoil and strongly acid or medium acid in the substratum.

Most areas of this soil have been cleared and are idle or are used for pasture. Many areas have reverted to woodland. An increasing acreage is being used for community developments.

This soil has poor potential for community development. It is limited mainly by its high water table and the slowly or very slowly permeable substratum. This soil is difficult to excavate; because of the high water table, the excavations are inundated. The substratum is very firm, and in many places there are stones and boulders in the soil as well as on the surface. When the soil is saturated, steep slopes of excavations tend to slump. This soil has poor potential for building foundations and basements because footings are placed below the depth of the high water table. Waste disposal systems, such as onsite septic systems, will not function satisfactorily without very unusual and costly design and installation because of the slowly permeable substratum and the high water table; even then they are subject to a high rate of failure. Many areas are subject to ponding in winter. This soil has poor potential for landscaping because of wetness. During the summer it remains wet for several days after rains, and it is frequently soggy and difficult to mow. Many plants do not adapt to the wet conditions of this soil. Stones and boulders on the surface also hinder landscaping. During construction of community developments, conservation measures are needed to prevent excessive siltation, runoff, and erosion.

This soil is poorly suited to cultivated crops. Wetness and stoniness are the major limiting factors for growing most crops. The stones and boulders interfere with the use of farming equipment and are costly to remove. Drainage is needed for good crop production. Erosion is easy to control.

This soil is suited to growing trees. It is limited mainly by wetness. Productivity is moderate. The use of equipment is severely limited by wetness. When this soil is not wet, machine planting is practical in open areas. Seed-

ling mortality is high, and tree windthrow is common because of the shallow rooting zone of the trees, which is caused by the high water table. Trees to favor in existing woodlots are eastern white pine, sugar maple, red maple, and northern red oak. Trees to plant are eastern white pine and white spruce.

The included Ludlow soils have greater potential for community development than this Wilbraham soil because they have a lower seasonal high water table and are wet for longer periods during the year. Capability subclass VIIs; woodland suitability subclass 4w.

WT—Wilbraham and Menlo extremely stony silt loams. This undifferentiated group consists of nearly level to gently sloping, poorly drained and very poorly drained soils. It is in drainageways and depressions on glacial uplands. Slopes range from 0 to 5 percent and are mostly 50 to 300 feet long. About 3 to 25 percent of the surface is covered with stones and boulders. About 60 percent of the total acreage consists of Wilbraham extremely stony silt loam, about 30 percent is Menlo extremely stony silt loam, and about 10 percent is other soils. The areas of this undifferentiated group are dominantly long and narrow or irregular in shape and are mostly 3 to 80 acres in size.

The soils of this map unit were not separated in mapping because they react similarly to most uses and management. Individual areas may contain only one of the named soils, and some areas may contain both soils. In many places, the soils occur in intricate patterns. The typical Wilbraham soil has a surface layer of very dark gray silt loam 4 inches thick. The subsoil is 21 inches thick; it is reddish brown, mottled silt loam. The substratum, described to a depth of 60 inches, is reddish brown, mottled, very firm loam. Typically, the Menlo soil has 3 inches of black muck on top of the surface layer. The surface layer is black silt loam 5 inches thick. The subsoil is 17 inches thick; it is 3 inches of gray, mottled silt loam over 14 inches of weak red, mottled loam. The substratum, described to a depth of 60 inches, is 8 inches of reddish brown, mottled, very firm loam over reddish brown, mottled, very firm gravelly loam.

Included with this soil in mapping are areas, up to 3 acres in size, of the poorly drained Walpole soils and the very poorly drained Palms soils and small areas of the moderately well drained Ludlow and Watchaug soils. A few small areas have more than 25 percent of the surface covered with stones and boulders, and a few places have slopes of up to 8 percent. In places these soils have a fine sandy loam or loam surface layer. Included areas make up 5 to 15 percent of this map unit.

From late in fall until mid-spring, the Wilbraham soils have a water table at a depth of about 8 inches. The Menlo soils have a water table at the surface from fall through spring and after heavy rains. In many places, they are ponded for several weeks in winter. During the summer, the water table in these soils may drop to a depth of 5 feet or more. Permeability is moderate in the surface layer and subsoil and slow or very slow in the substratum. The available water capacity is high. Runoff is slow or very slow. The soils have a low shrink-swell potential. In areas that are not limed, the Wilbraham soils are very strongly acid or strongly acid in the surface layer and subsoil and strongly acid or medium acid in the substratum. The Menlo soils are very strongly acid through medium acid in the surface layer and subsoil and strongly acid through slightly acid in the substratum.

Most of this map unit is in woodland. A few small areas are used for pasture or are idle. Only a small acreage is cleared and is in community developments.

The soils of this unit have poor potential for community development. They are limited mainly by the seasonal high water table, stoniness, and a slowly permeable substratum. These soils are difficult to excavate because of the high water table and stoniness. When the soil is saturated, the steep slopes of excavations tend to slump. These soils have poor potential for building foundations and basements because footings are placed below the depth of the high water table. Waste disposal systems, such as onsite septic systems, will not function satisfactorily without very unusual and costly design and installation because of the high water table much of the year and the slowly or very slowly permeable substratum; even then, disposal systems have a high rate of failure. Removal of stones and boulders is very costly. In some small areas, stones are often left undisturbed because of their esthetic value. During construction of community developments, conservation measures are needed to prevent excessive siltation, runoff, and erosion.

This unit is poorly suited to use as cropland. The use of farming equipment on these soils is not feasible because of the stoniness. Removal of the stones and boulders is very costly and generally not feasible.

This unit has fair suitability for woodland use. The Wilbraham soils have moderate productivity, and the Menlo soils have low productivity. The soils are limited mainly by their wetness and stoniness. Seedling mortality is high, and windthrow is common. The root zone is shallow because the water table is high throughout much of the year. Woodland, nevertheless, may be one of the best uses of these soils. Trees to favor in existing woodlots are eastern white pine, sugar maple, red maple, and northern red oak. Trees to plant on the Wilbraham soils are eastern white pine and white spruce.

The included Ludlow and Watchaug soils have fair potential for community development. The Walpole and Palms soils have poor potential because of a high or very high water table much of the year. The Palms soils have 16 to 50 inches of organic material on top of the mineral soil. Capability subclass VIIs; Wilbraham soil, woodland suitability subclass 4x, and Menlo soil, woodland suitability subclass 5x.

WxA—Woodbridge fine sandy loam, 0 to 3 percent slopes. This nearly level, moderately well drained soil is on the top of drumlins and in slight depressions on hills and ridges on glacial uplands. Slopes are smooth and concave and are mostly 100 to 300 feet long. The areas are dominantly oval or long and narrow and are mostly 5 to 30 acres in size.

Typically, the surface layer is dark brown fine sandy loam 7 inches thick. The subsoil is 18 inches thick. It is dark yellowish brown fine sandy loam over olive brown, mottled fine sandy loam. The substratum, described to a depth of 60 inches, is olive, mottled, very firm gravelly fine sandy loam.

Included with this soil in mapping are small intermingled areas, generally less than 1 acre in size, of well drained Paxton soils, moderately well drained Sutton soils, and poorly drained Ridgebury soils. Included areas make up 5 to 15 percent of this map unit.

From late in fall until mid-spring, this soil has a water table at a depth of about 20 inches. Permeability is moderate in the surface layer and subsoil and slow in the substratum. The available water capacity is moderate. Runoff is slow. This soil tends to dry out and warm up slowly in the spring. It has a low shrink-swell potential. In areas that are not limed, this soil is strongly acid through medium acid.

Most of this soil is cropland and is used for hay and corn. A few areas are used to grow vegetables and nursery stock. A significant and increasing acreage of idle land is being used for community developments. Some acreage is woodland.

This soil has fair potential for community development. It is limited mainly by the seasonal high water table and by the slowly permeable substratum. This soil is fairly easy to excavate; however, the substratum is very firm, and in many places there are stones and boulders. Because of the seasonal high water table, excavations are inundated. When the soil is saturated, steep slopes of excavations are not stable and tend to slump. Waste disposal systems, such as an onsite septic system, will not function satisfactorily with only normal design and installation because of the seasonal high water table and the slowly permeable substratum. Very careful and often costly design and installation are required to insure a satisfactory system. In places this soil is subject to ponding during winter. It is well suited to landscaping, but it may remain wet and soggy for several days after heavy rains. During construction of community developments, conservation measures are needed to prevent excessive runoff, erosion, and siltation.

This soil is well suited to cultivated crops. Good tilth is easy to maintain. Wetness is the major limiting factor for most crops, and drainage is needed for the best crop production. Erosion is easy to control. If this soil is cultivated, using cover crops helps reduce runoff and control erosion. Stones and boulders near the surface are an annoyance when using some tillage equipment.

This soil is well suited to trees. Productivity is moderately high. Machine planting is practical in open areas. Trees to favor in existing woodlots are eastern white pine, sugar maple, and northern red oak. Trees to plant in open areas are eastern white pine and European larch.

The included Paxton and Sutton soils have fair potential for community developments. The Paxton soils are limited by the slowly permeable substratum and the Sutton soils by a seasonal high water table at a depth of about 20 inches. The Ridgebury soils have poor potential because of a water table at a depth of about 8 inches from fall until mid-spring and a slowly permeable substratum. Capability subclass IIw; woodland suitability subclass 3o.

Woodbridge fine sandy loam, 3 to 8 percent slopes. This gently sloping, moderately well drained soil is on the top of drumlins, in slight depressions, and at the base of drumlins on glacial uplands. Slopes are smooth and concave and are mostly 100 to 500 feet long. The areas are dominantly oval or long and narrow and are mostly 5 to 40 acres in size.

Typically, the surface layer is dark brown fine sandy loam 7 inches thick. The subsoil is 18 inches thick. It is dark yellowish brown fine sandy loam over olive brown, mottled fine sandy loam. The substratum, described to a depth of 60 inches, is olive, mottled, very firm gravelly fine sandy loam.

Included with this soil in mapping are small intermingled areas, generally less than an acre in size, of well drained Paxton soils, moderately well drained Sutton soils, and poorly drained Ridgebury soils. In a few areas in Southbury, the soils have redder colors in the substratum. Included areas make up 5 to 15 percent of this unit.

From late in fall until mid-spring, this soil has a water table at a depth of about 20 inches. Permeability is moderate in the surface layer and subsoil and slow in the substratum. The available water capacity is moderate. Runoff is medium. This soil tends to dry out and warm up slowly in the spring. It has a low shrink-swell potential. Unless limed, this soil is strongly acid through medium acid.

Most of this soil is used to grow hay and corn. A few areas are used to grow vegetables and nursery stock. A significant and rapidly increasing acreage of idle land is being used for community developments. Some acreage is in woodland.

This soil has fair potential for community development. It is limited mainly by the seasonal high water table and by the slowly permeable substratum. It is fairly easy to excavate; however, the substratum is very firm, and in many places there are stones and boulders. Because of the seasonal high water table, excavations are inundated. Steep slopes of excavations are unstable when the soil is saturated and tend to slump. Waste disposal systems, such as an onsite septic system, will not function satisfactorily with only normal design and installation be-

cause of the seasonal high water table and slowly permeable substratum. Very careful and often costly design and installation are required to insure that a system works satisfactorily. During construction of community developments, conservation measures are needed to prevent excessive runoff, erosion, and siltation.

This soil is well suited to cultivated crops. Good tilth is easy to maintain. Wetness is the major limiting factor for most crops, and drainage is needed for the best crop production. The hazard of erosion is moderate, and controlling runoff and erosion is a concern in managing this soil. If this soil is cultivated, minimum tillage, use of cover crops, and including grasses and legumes in the cropping system are practices that help reduce runoff and control erosion.

This soil is well suited to trees. Productivity is moderately high. Machine planting is practical in open areas. Trees to favor in existing woodlots are eastern white pine, sugar maple, and northern red oak. Trees to plant in open areas are eastern white pine and European larch.

The included Paxton and Sutton soils have fair potential for community development; the Paxton soils are limited mainly by the slowly permeable substratum and the Sutton soils by a seasonal high water table at a depth of about 20 inches. The Ridgebury soils have poor potential because of a high water table at a depth of about 8 inches from fall until mid-spring and a slowly permeable substratum. Capability subclass IIw; woodland suitability subclass 3o.

WyB—Woodbridge very stony fine sandy loam, 3 to 8 percent slopes. This gently sloping, moderately well drained soil is on the top of drumlins and at the base of drumlins and ridges on glacial uplands. It has 0.1 to 3 percent of the surface covered with stones and boulders. Slopes are smooth and concave and generally are 100 to 500 feet long. The areas are dominantly oval or long and narrow and are mostly 5 to 35 acres in size.

Typically, the surface layer is dark brown fine sandy loam 6 inches thick. The subsoil is 19 inches thick. It is dark yellowish brown fine sandy loam over olive brown, mottled fine sandy loam. The substratum, described to a depth of 60 inches, is olive, mottled, very firm gravelly fine sandy loam.

Included with this soil in mapping are small intermingled areas, generally less than 1 acre in size, of well drained Paxton soils, moderately well drained Sutton soils, and poorly drained Ridgebury soils. In a few small areas, more than 3 percent of the surface is covered with stones and boulders. In a few areas, slopes are less than 3 percent. Included areas make up 5 to 15 percent of this map unit.

From late in fall until mid-spring, this soil has a water table at a depth of about 20 inches. Permeability is moderate in the surface layer and subsoil and slow in the substratum. This soil has a moderate available water capacity. Runoff is medium. This soil tends to dry out and warm up slowly in the spring. It has a low shrink-swell potential. In areas that are not limed, this soil is strongly acid through medium acid.

Most areas of this soil have been cleared and were used for cropland or pasture at one time. Many of the stones and smaller boulders were removed, leaving only the larger stones and boulders in many places. Many areas of this soil are reverting to woodland or are idle. An increasing acreage is being used for community developments.

This soil has fair potential for community development. It is fairly easy to excavate; however, the substratum is very firm, and in many areas there are stones and boulders in the soil as well as on the surface. Because of the seasonal high water table, excavations are frequently inundated. Steep slopes of excavations are not stable when the soil is saturated and tend to slump. Particular attention needs to be given to building houses that have a basement because the basement generally is below the depth of the water table. A wet basement results unless the soil is drained. Waste disposal systems, such as an onsite septic system, will generally not function satisfactorily with only normal design and installation because of the slowly permeable substratum and the seasonal high water table. Very careful and often costly design and installation are required to insure a satisfactory system. The stones and boulders on the surface interfere with landscaping and are costly to remove. During construction of community developments, conservation measures are needed to prevent excessive runoff, erosion, and siltation.

This soil is poorly suited to cultivated crops because of its stoniness. The stones and boulders interfere with the use of farm equipment. If the stones and boulders are removed, this soil is well suited to cultivated crops, but removing stones is costly. This soil has a wetness limitation, and drainage is needed for the best crop production. The hazard of erosion is moderate, and controlling runoff and erosion is a concern in managing this soil. If this soil is cultivated, minimum tillage, use of cover crops, and including grasses and legumes in the cropping system help reduce runoff and control erosion.

This soil is well suited to trees. Productivity is moderately high. The stones and boulders slightly hinder the use of harvesting and planting equipment, but machine planting is practical in open areas. Trees to favor in existing woodlots are eastern white pine, sugar maple, and northern red oak. Trees to plant in open areas are eastern white pine and European larch.

The included Paxton and Sutton soils have fair potential for community development. Paxton soils are limited by the slowly permeable substratum and Sutton soil by a seasonal high water table at a depth of about 20 inches. The Ridgebury soils have poor potential because of a high water table at a depth of about 8 inches from fall

until mid-spring and a slowly permeable substratum. Capability subclass VIs; woodland suitability subclass 3o.

WzC—Woodbridge extremely stony fine sandy loam, 3 to 15 percent slopes. This gently sloping and sloping, moderately well drained soil is on the top and sides of ridges and hills on glacial uplands. It has 3 to 25 percent of the surface covered with stones and boulders. Slopes are mostly smooth and concave. They are mostly 100 to 500 feet long. The areas are dominantly irregular or rectangular in shape and are mostly 5 to 50 acres in size.

Typically, the surface layer is very dark brown fine sandy loam 2 inches thick. The subsoil is 23 inches thick. It is dark yellowish brown fine sandy loam in the upper 16 inches and olive brown, mottled fine sandy loam below that. The substratum, to a depth of 60 inches, is olive, mottled, very firm gravelly fine sandy loam.

Included with this soil in mapping are small intermingled areas, generally less than 1 acre in size, of well drained Paxton soils, moderately well drained Sutton soils, and poorly drained Ridgebury soils. A few small areas have less than 3 percent of the surface covered with stones and boulders. The included areas make up 5 to 15 percent of this map unit.

From late in fall until mid-spring, this soil has a water table at a depth of about 20 inches. This soil has moderate permeability in the surface layer and subsoil and slow permeability in the substratum. The available water capacity is high. Runoff is medium to rapid. This soil tends to dry out and warm up slowly in the spring. It has a low shrink-swell potential. In areas that are not limed, this soil is strongly acid through medium acid.

This soil is mostly in woodland. A small acreage is cleared and is used as pasture, or it is idle. An increasing acreage is being used for community developments.

This soil has fair potential for community development. It is limited mainly by the seasonal high water table at a depth of about 20 inches, its stoniness, and, in places, the steepness of slopes. This soil is fairly easy to excavate, but in many areas it has stones and boulders below the surface as well as on the surface. Because of the seasonal high water table, excavations are frequently inundated. When the soil is saturated, steep slopes of excavations are unstable and tend to slump. Particular attention needs to be given to building houses that have a basement because the basement generally is below the depth of the water table. A wet basement results unless the soil is drained. Waste disposal systems, such as an onsite septic system, will generally not function with only normal design and installation because of the seasonal high water table and the slowly permeable substratum. Very careful and often costly design and installation are required to insure that onsite septic systems function satisfactorily. Particular attention needs to be given to insure that effluent does not seep to the surface downslope from the system, especially if the system is installed on the steeper slopes. The stones and boulders hinder the installation of onsite septic systems in places. They also limit the use of this soil for landscaping. Removing the stones and boulders is costly, and large boulders are sometimes left undisturbed for their esthetic value. During construction of community developments, conservation measures are needed to control runoff, erosion, and sedimentation.

This soil is poorly suited to use as cropland because of its stoniness. The stones and boulders are costly to remove; unless they are removed, the use of modern farming equipment generally is not feasible. This soil has a moderate to severe erosion hazard; conservation measures such as permanent vegetation are needed to control runoff and erosion.

This soil is well suited to trees. Productivity is moderately high. The stones and boulders somewhat hinder the use of some harvesting equipment and make planting generally not feasible. Trees to favor in existing woodlots are eastern white pine, sugar maple, and northern red oak. Trees to plant in open areas are eastern white pine and European larch.

The included Paxton and Sutton soils have fair potential for community development. Paxton soils are limited because of a slowly permeable substratum and Sutton soils because of a seasonal high water table at a depth of about 20 inches. Ridgebury soils have poor potential because of a high water table at a depth of about 8 inches and a slowly permeable substratum. Capability subclass VIIs; woodland suitability subclass 3x.

YaB—Yalesville fine sandy loam, 3 to 8 percent slopes. This gently sloping, well drained soil is on broad hilltops and ridges. The relief is affected by the underlying bedrock. Slopes are smooth and convex. They are mostly 100 to 300 feet long. The areas are dominantly irregular in shape and are mostly 5 to 80 acres in size.

Typically, the surface layer of this soil is dark brown fine sandy loam 8 inches thick. The subsoil is 17 inches thick. It is reddish brown, friable fine sandy loam and loam. The substratum, described to a depth of 36 inches, is reddish brown sandy loam. Reddish brown, hard sandstone bedrock is at a depth below 36 inches.

Included with this soil in mapping are small intermingled areas, generally less than 1 acre in size, of excessively drained Holyoke soils, well drained Cheshire and Wethersfield soils, and moderately well drained Watchaug and Ludlow soils. In a few areas the surface layer is silt loam, and in a few small areas the slopes are less than 3 percent. Included areas make up 5 to 15 percent of this map unit.

This soil has moderate or moderately rapid permeability above the bedrock. The available water capacity is moderate. Runoff is medium. Good tilth is easy to maintain. This soil tends to dry out and warm up early in the spring. It has a low shrink-swell potential. In areas that

are not limed, this soil is very strongly acid through medium acid.

Most areas of this soil have been cleared; they are now idle or in community developments. Many small areas are used to grow hay, corn, vegetables, nursery stock, and fruit orchards. A small acreage is in woodland.

This soil has fair potential for community development. It is difficult to excavate because the bedrock is at a depth of 20 to 40 inches. Waste disposal systems, such as an onsite septic system, need very careful and often costly design and installation to insure that they function properly. This soil is well suited to landscaping. During construction of community developments, conservation measures are needed to prevent excessive runoff, erosion, and siltation.

This soil is well suited to cultivated crops. It is easy to maintain in good tilth. The hazard of erosion is moderate, and controlling runoff and erosion is a concern in managing this soil for farming. If this soil is cultivated, minimum tillage, use of cover crops, and including grasses and legumes in the cropping system help to reduce runoff and control erosion and sedimentation.

This soil is suited to growing trees. It has moderate productivity. Windthrow is a hazard with large trees because of the limited rooting zone above the bedrock. Machine planting is practical in open areas. Trees to favor in existing woodlots are eastern white pine, sugar maple, and northern red oak. Trees to plant are eastern white pine.

The included Cheshire soils are better suited to community development than this Yalesville soil. The Wethersfield soils have fair potential and are limited mainly by the slowly permeable or very slowly permeable substratum. The Holyoke soils have poor potential because of bedrock at a depth of 10 to 20 inches. From fall until mid-spring, the Ludlow and Watchaug soils have a water table at a depth of about 20 inches. Capability subclass IIe; woodland suitability subclass 4o.

YaC—Yalesville fine sandy loam, 8 to 15 percent slopes. This sloping, well drained soil is on hills and ridges. The relief is affected by the underlying bedrock. Slopes are smooth and convex. They are mostly 100 to 300 feet long. The areas are dominantly irregular in shape and are mostly 5 to 45 acres in size.

Typically, the surface layer of this soil is dark brown fine sandy loam 8 inches thick. The subsoil is 17 inches thick. It is reddish brown, friable fine sandy loam and loam. The substratum, described to a depth of 36 inches, is reddish brown sandy loam. Reddish brown, hard sandstone bedrock is at a depth below 36 inches.

Included with this soil in mapping are small intermingled areas, generally less than 1 acre in size, of somewhat excessively drained Holyoke soils and well drained Cheshire and Wethersfield soils. In a few areas the surface layer is silt loam. Included areas make up 5 to 15 percent of this map unit.

This soil has moderate or moderately rapid permeability above bedrock. The available water capacity is moderate. Runoff is rapid. Good tilth is easy to maintain. This soil tends to dry out and warm up early in the spring. It has a low shrink-swell potential. Unless limed, this soil is very strongly acid through medium acid.

Most areas of this soil have been cleared and are now idle or in community developments. Many small areas, less than 10 acres in size, are used to grow hay, corn, vegetables, and orchards. The remaining acreage is in woodland.

This soil has fair potential for community development. It is limited mainly by the bedrock at a depth of 20 to 40 inches and by the steepness of slopes. These limitations cause additional expense in building roads, installing sewer and water lines, building homes, and designing and installing onsite septic systems. This soil is difficult to excavate because of the bedrock. Onsite septic systems require very careful and often costly design and installation to insure that the system functions properly and that effluent will not seep to the surface downslope from the disposal system. Conservation measures, such as temporary vegetation and silt basins, should be used to prevent excessive runoff, erosion, and siltation during construction of community developments.

This soil is suited to cultivated crops, but it has a severe erosion hazard. Controlling runoff and erosion is the major concern of management. Other concerns of management are maintaining fertility, good organic matter content, and good tilth. If this soil is used as cropland, minimum tillage, use of cover crops, and including grasses and legumes in the cropping system help to reduce runoff and control erosion.

This soil is suited to trees. Productivity is moderate. Windthrow is a hazard with large trees because of the limited rooting zone above bedrock. Machine planting is practical in open areas. Trees to favor in existing woodlots are eastern white pine, sugar maple, and northern red oak. Trees to plant are eastern white pine.

The included Cheshire soils are better suited to community development than this Yalesville soil. The Wethersfield soils have fair potential and are limited mainly by the slowly or very slowly permeable substratum and the steepness of slopes. The Holyoke soils have poor potential because of bedrock at a depth of 10 to 20 inches. Capability subclass IIIe; woodland suitability subclass 4o.

Use and management of the soils

The soil survey is a detailed inventory and evaluation of the most basic resource of the survey area—the soil. It is useful in adjusting land use, including urbanization, to the limitations and potentials of natural resources and

the environment. Also, it can help avoid soil-related failures in uses of the land.

While a soil survey is in progress, soil scientists, conservationists, engineers, and others keep extensive notes about the nature of the soils and about unique aspects of behavior of the soils. These notes include data on erosion, drought damage to specific crops, yield estimates, flooding, the functioning of septic tank disposal systems, and other factors affecting the productivity, potential, and limitations of the soils under various uses and management. In this way, field experience and measured data on soil properties and performance are used as a basis for predicting soil behavior.

Information in this section is useful in planning use and management of soils for crops and pasture, rangeland, and woodland, as sites for buildings, highways and other transportation systems, sanitary facilities, and parks and other recreation facilities, and for wildlife habitat. From the data presented, the potential of each soil for specified land uses can be determined, soil limitations to these land uses can be identified, and costly failures in houses and other structures, caused by unfavorable soil properties, can be avoided. A site where soil properties are favorable can be selected, or practices that will overcome the soil limitations can be planned.

Planners and others using the soil survey can evaluate the impact of specific land uses on the overall productivity of the survey area or other broad planning area and on the environment. Productivity and the environment are closely related to the nature of the soil. Plans should maintain or create a land-use pattern in harmony with the natural soil.

Contractors can find information that is useful in locating sources of sand and gravel, roadfill, and topsoil. Other information indicates the presence of bedrock, wetness, or very firm soil horizons that cause difficulty in excavation.

Health officials, highway officials, engineers, and many other specialists also can find useful information in this soil survey. The safe disposal of wastes, for example, is closely related to properties of the soil. Pavements, sidewalks, campsites, playgrounds, lawns, and trees and shrubs are influenced by the nature of the soil.

Crops and pasture

The major management concerns in the use of the soils for crops and pasture are discussed in the descriptions of the soil map units. In this section the system of land capability classification used by the Soil Conservation Service is explained (*9*); and the estimated yields of the main crops and hay and pasture plants are presented for each soil.

For each kind of soil, information about management is presented in the section "Soil maps for detailed planning." Planners of management systems for individual fields or farms should also consider the detailed information given in the description of each soil.

Yields per acre

The average yields per acre that can be expected of the principal crops under a high level of management are shown in table 5. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors. Absence of an estimated yield indicates that the soil is not suited to the crop or the crop is not commonly grown on the soil or that a given crop is not commonly irrigated.

The estimated yields were based mainly on the experience and records of farmers, conservationists, and extension agents. Results of field trials and demonstrations and available yield data from nearby counties were also considered.

The yields were estimated assuming that the latest soil and crop management practices were used. Hay and pasture yields were estimated for the most productive varieties of grasses and legumes suited to the climate and the soil. A few farmers may be obtaining average yields higher than those shown in table 5.

The management needed to achieve the indicated yields of the various crops depends on the kind of soil and the crop. Such management provides drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate tillage practices, including time of tillage and seedbed preparation and tilling when soil moisture is favorable; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop residues, barnyard manure, and green-manure crops; harvesting crops with the smallest possible loss; and timeliness of all fieldwork.

The estimated yields reflect the productive capacity of the soils for each of the principal crops. Yields are likely to increase as new production technology is developed. The productivity of a given soil compared with that of other soils, however, is not likely to change.

Crops other than those shown in table 5 are grown in the survey area, but estimated yields are not included because the acreage of these crops is small. The local offices of the Soil Conservation Service and the Cooperative Extension Service can provide information about the management concerns and productivity of the soils for these crops.

Capability classes and subclasses

Capability classes and subclasses show, in a general way, the suitability of soils for most kinds of field crops. The soils are classed according to their limitations when they are used for field crops, the risk of damage when they are used, and the way they respond to treatment.

The grouping does not take into account major and generally expensive landforming that would change slope, depth, or other characteristics of the soils; does not take into consideration possible but unlikely major reclamation projects; and does not apply to rice, cranberries, horticultural crops, or other crops that require special management. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for rangeland, for forest trees, or for engineering purposes.

In the capability system, all kinds of soil are grouped at three levels: capability class, subclass, and unit (*9*). These levels are defined in the following paragraphs. A survey area may not have soils of all classes.

Capability classes, the broadest groups, are designated by Roman numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class I soils have few limitations that restrict their use.

Class II soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

Class III soils have severe limitations that reduce the choice of plants, or that require special conservation practices, or both.

Class IV soils have very severe limitations that reduce the choice of plants, or that require very careful management, or both.

Class V soils are not likely to erode but have other limitations, impractical to remove, that limit their use.

Class VI soils have severe limitations that make them generally unsuitable for cultivation.

Class VII soils have very severe limitations that make them unsuitable for cultivation.

Class VIII soils and landforms have limitations that nearly preclude their use for commercial crop production.

Capability subclasses are soil groups within one class; they are designated by adding a small letter, *e, w, s,* or *c,* to the class numeral, for example, IIe. The letter *e* shows that the main limitation is risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c*, used in only some parts of the United States, shows that the chief limitation is climate that is too cold or too dry.

In class I there are no subclasses because the soils of this class have few limitations. Class V contains only the subclasses indicated by *w, s,* or *c* because the soils in class V are subject to little or no erosion, though they have other limitations that restrict their use to pasture, rangeland, woodland, wildlife habitat, or recreation.

The acreage of soils in each capability class and subclass is indicated in table 6. All soils in the survey area except those named at a level higher than the series are included. Some of the soils that are well suited to crops and pasture may be in low-intensity use, for example, soils in capability classes I and II. Data in this table can be used to determine the farming potential of such soils.

The capability subclass is identified in the description of each soil map unit in the section "Soil maps for detailed planning."

Woodland management and productivity

Table 7 contains information useful to woodland owners or forest managers in planning the use of soils for wood crops. Only those soils suitable for wood crops are listed, and the ordination (woodland suitability) symbol for each soil is given. All soils bearing the same ordination symbol require the same general kinds of woodland management and have about the same potential productivity.

The first part of the *ordination symbol*, a number, indicates the potential productivity of the soils for important trees. The number 1 indicates very high productivity; 2, high; 3, moderately high; 4, moderate; and 5, low. The second part of the symbol, a letter, indicates the major kind of soil limitation. The letter *x* indicates stoniness or rockiness; *w*, excessive water in or on the soil; *t*, toxic substances in the soil; *d*, restricted root depth; *c*, clay in the upper part of the soil; *s*, sandy texture; *f*, high content of coarse fragments in the soil profile; and *r*, steep slopes. The letter *o* indicates insignificant limitations or restrictions. If a soil has more than one limitation, priority in placing the soil into a limitation class is in the following order: x, w, t, d, c, s, f, and r.

In table 7 the soils are also rated for a number of factors to be considered in management. *Slight, moderate,* and *severe* are used to indicate the degree of major soil limitations.

Ratings of the *erosion hazard* indicate the risk of loss of soil in well managed woodland. The risk is *slight* if the expected soil loss is small, *moderate* if some measures are needed to control erosion during logging and road construction, and *severe* if intensive management or special equipment and methods are needed to prevent excessive loss of soil.

Ratings of *equipment limitation* reflect the characteristics and conditions of the soil that restrict use of the equipment generally needed in woodland management or harvesting. A rating of *slight* indicates that use of equipment is not limited to a particular kind of equipment or time of year; *moderate* indicates a short seasonal limitation or a need for some modification in management or equipment; *severe* indicates a seasonal limitation, a need for special equipment or management, or a hazard in the use of equipment.

Seedling mortality ratings indicate the degree that the soil affects expected mortality of planted tree seedlings. Plant competition is not considered in the ratings. Seed-

lings from good planting stock that are properly planted during a period of sufficient rainfall are rated. A rating of *slight* indicates that the expected mortality of the planted seedlings is less than 25 percent; *moderate*, 25 to 50 percent; and *severe*, more than 50 percent.

Considered in the ratings of *windthrow hazard* are characteristics of the soil that affect the development of tree roots and the ability of the soil to hold trees firmly. A rating of *slight* indicates that trees in wooded areas are not expected to be blown down by commonly occurring winds; *moderate*, that some trees are blown down during periods of excessive soil wetness and strong winds; and *severe*, that many trees are blown down during periods of excessive soil wetness and moderate or strong winds.

The *potential productivity* of merchantable or *important trees* on a soil is expressed as a *site index*. This index is the average height, in feet, that dominant and codominant trees of a given species attain at 50 years of age. The site index applies to fully stocked, even-aged, unmanaged stands. Important trees are those that woodland managers generally favor in intermediate or improvement cuttings. They are selected on the basis of growth rate, quality, value, and marketability.

Trees to plant are those that are suitable for commercial wood production and that are suited to the soils.

Engineering

Whitney T. Ferguson, Jr., state conservation engineer, Soil Conservation Service, Storrs, Connecticut, helped prepare this section.

This section provides information about the use of soils for building sites, sanitary facilities, construction material, and water management. Among those who can benefit from this information are engineers, landowners, community planners, town and city managers, land developers, builders, contractors, and farmers.

The ratings in the engineering tables are based on test data and estimated data in the "Soil properties" section. The ratings were determined jointly by soil scientists and engineers of the Soil Conservation Service using known relationships between the soil properties and the behavior of soils in various engineering uses.

Among the soil properties and site conditions identified by a soil survey and used in determining the ratings in this section were grain-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock that is within 5 or 6 feet of the surface, soil wetness, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure or aggregation, in-place soil density, and geologic origin of the soil material. If pertinent, data about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kind of absorbed cations were also considered.

On the basis of information assembled about soil properties, ranges of values can be estimated for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, shear strength, compressibility, slope stability, and other factors of expected soil behavior in engineering uses. As appropriate, these values can be applied to each major horizon of each soil or to the entire profile.

These factors of soil behavior affect construction and maintenance of roads, airport runways, pipelines, foundations for small buildings, ponds and small dams, irrigation projects, drainage systems, sewage and refuse disposal systems, and other engineering works. The ranges of values can be used to (1) select potential residential, commercial, industrial, and recreational areas; (2) make preliminary estimates pertinent to construction in a particular area; (3) evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; (4) evaluate alternative sites for location of sanitary landfills, onsite sewage disposal systems, and other waste disposal facilities; (5) plan detailed onsite investigations of soils and geology; (6) find sources of gravel, sand, clay, and topsoil; (7) plan farm drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; (8) relate performance of structures already built to the properties of the kinds of soil on which they are built so that performance of similar structures on the same or a similar soil in other locations can be predicted; and (9) predict the trafficability of soils for cross-country movement of vehicles and construction equipment.

Data presented in this section are useful for land-use planning and for choosing alternative practices or general designs that will overcome unfavorable soil properties and minimize soil-related failures. Limitations to the use of these data, however, should be well understood. First, the data are generally not presented for soil material below a depth of 5 or 6 feet. Also, because of the scale of the detailed map in this soil survey, small areas of soils that differ from the dominant soil are included in mapping. Thus, these data do not eliminate the need for onsite investigations, testing, and analysis by personnel having expertise in the specific use contemplated.

The information is presented mainly in tables. Table 8 shows, for each kind of soil, the degree and kind of limitations for building site development; table 9, for sanitary facilities; and table 11, for water management. Table 10 shows the suitability of each kind of soil as a source of construction materials.

The information in the tables, along with the soil map, the soil descriptions, and other data provided in this survey, can be used to make additional interpretations and to construct interpretive maps for specific uses of land.

Some of the terms used in this soil survey have a special meaning in soil science. Many of these terms are defined in the Glossary.

Building site development

The degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, and local roads and streets are indicated in table 8. A *slight* limitation indicates that soil properties generally are favorable for the specified use and that limitations are minor and easily overcome. A *moderate* limitation indicates that soil properties and site features are unfavorable for the specified use, but the limitations can be overcome or minimized by special planning and design. A *severe* limitation indicates that one or more soil properties or site features are so unfavorable or difficult to overcome that a major increase in construction effort, special design, or intensive maintenance is required. For some soils that are rated severe, costly measures may not be feasible.

Shallow excavations are made for pipelines, sewerlines, communications and power transmission lines, basements, open ditches, and cemeteries. Such digging or trenching is influenced by soil wetness caused by a seasonal high water table; the texture and consistence of soils; the tendency of soils to cave in or slough; and the presence of very firm, dense soil layers, bedrock, or large stones. In addition, excavations are affected by slope of the soil and the probability of flooding. Ratings do not apply to soil horizons below a depth of 6 feet unless otherwise noted.

In the soil series descriptions, the consistence of each soil horizon is given, and the presence of very firm or extremely firm horizons, usually difficult to excavate, is indicated.

Dwellings and *small commercial buildings* referred to in table 8 are built on undisturbed soil and have foundation loads of a dwelling no more than three stories high. Separate ratings are made for small commercial buildings without basements and for dwellings with and without basements. For such structures, soils should be sufficiently stable that cracking or subsidence of the structure from settling or shear failure of the foundation does not occur. These ratings were determined from estimates of the shear strength, compressibility, and shrink-swell potential of the soil. Soil texture, plasticity and in-place density, potential frost action, soil wetness, and depth to a seasonal high water table were also considered. Soil wetness and depth to a seasonal high water table indicate potential difficulty in providing adequate drainage for basements, lawns, and gardens. Depth to bedrock, slope, and large stones in or on the soil are also important considerations in the choice of sites for these structures and were considered in determining the ratings. Susceptibility to flooding is a serious hazard.

Local roads and streets referred to in table 8 have an all-weather surface that can carry light to medium traffic all year. They consist of a subgrade of the underlying soil material; a base of gravel, crushed rock fragments, or soil material stabilized with lime or cement; and a flexible or rigid surface, commonly asphalt or concrete. The roads are graded with soil material at hand, and most cuts and fills are less than 6 feet deep.

The load supporting capacity and the stability of the soil as well as the quantity and workability of fill material available are important in design and construction of roads and streets. The classifications of the soil and the soil texture, density, shrink-swell potential, and potential frost action are indicators of the traffic supporting capacity used in making the ratings. Soil wetness, flooding, slope, depth to hard rock or very compact layers, and content of large stones affect stability and ease of excavation.

Lawns and landscaping require soils that are suitable for the establishment and maintenance of turf for lawns and ornamental trees and shrubs for landscaping. The best soils are firm after rains, are not dusty when dry, and absorb water readily and hold sufficient moisture for plant growth. The surface layer should be free of stones. If shaping is required, the soils should be thick enough over bedrock or hardpan to allow for necessary grading. In rating the soils, the availability of water for sprinkling is assumed.

Sanitary facilities

David E. Hill, associate soil scientist, Connecticut Agricultural Experiment Station, New Haven, Connecticut, helped prepare this section.

Favorable soil properties and site features are needed for proper functioning of septic tank absorption fields, sewage lagoons, and sanitary landfills. The nature of the soil is important in selecting sites for these facilities and in identifying limiting soil properties and site features to be considered in design and installation. Also, those soil properties that affect ease of excavation or installation of these facilities will be of interest to contractors and local officials. Table 9 shows the degree and kind of limitations of each soil for such uses and for use of the soil as daily cover for landfills. It is important to observe local ordinances and regulations.

If the degree of soil limitation is expressed as *slight*, soils are generally favorable for the specified use and limitations are minor and easily overcome; if *moderate*, soil properties or site features are unfavorable for the specified use, but limitations can be overcome by special planning and design; and if *severe*, soil properties or site features are so unfavorable or difficult to overcome that major soil reclamation, special design, or intensive maintenance is required. Soil suitability is rated by the terms *good*, *fair*, and *poor*, which mean about the same as *slight*, *moderate*, and *severe*.

Septic tank absorption fields are subsurface systems of tile or perforated pipe that distribute effluent from a septic tank into the natural soil. Only the soil horizons between depths of 18 and 72 inches are evaluated for this use. The soil properties and site features considered

are those that affect the absorption of the effluent and those that affect the construction of the system (*4*).

Properties and features that affect absorption of the effluent are permeability, depth to seasonal high water table, depth to bedrock, and susceptibility to flooding. Stones, boulders, and shallowness to bedrock interfere with installation. Excessive slope can cause lateral seepage and surfacing of the effluent. Also, soil erosion and soil slippage are hazards if absorption fields are installed on sloping soils.

In some soils, loose sand and gravel or fractured bedrock is less than 4 feet below the tile lines. In these soils the absorption field does not adequately filter the effluent, and ground water in the area may be contaminated.

On many of the soils that have moderate or severe limitations for use as septic tank absorption fields, a system to lower the seasonal water table can be installed or the size of the absorption field can be increased so that performance is satisfactory.

Longevity estimates can be used to evaluate performance of septic tank absorption fields (*6*). This is done in terms of (1) half-life and (2) early failure. Half-life is the number of years before 50 percent of all absorption fields are expected to fail. Twenty-five years is used as an arbitrary point of reference. Early failure is the percentage of absorption fields expected to fail within 5 years after installation. Class limits include less than 5 percent, 5 to 10 percent, and greater than 10 percent. Longevity estimates for soils in the county follow. Evaluations have not been made for poorly drained and very poorly drained soils, soils that formed in alluvium, or for soils that have bedrock at a depth of less than 40 inches.

A. Half-life, less than 25 years; early failure, 5 to 10 percent: Branford, Charlton, Cheshire, Ellington, Haven, and Sutton.

B. Half-life, more than 25 years; early failure, less than 5 percent: Agawam, Deerfield, Hinckley, Manchester, Ninigret, and Penwood.

C. Half-life, more than 25 years; early failure, 5 to 10 percent: Scio and Watchaug.

D. Half-life, more than 25 years; early failure, more than 10 percent: Ludlow, Paxton, Wethersfield, Woodbridge.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons have a nearly level floor and cut slopes or embankments of compacted soil material. Aerobic lagoons generally are designed to hold sewage within a depth of 2 to 5 feet. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water. Soils that are very high in content of organic matter and those that have cobbles, stones, or boulders are not suitable. Unless the soil has very slow permeability, contamination of ground water is a hazard if the seasonal high water table is above the level of the lagoon floor. If the water table is seasonally high, seepage of ground water into the lagoon can seriously reduce the lagoon's capacity for liquid waste. Slope, depth to bedrock, and susceptibility to flooding also affect the suitability of sites for sewage lagoons or the cost of construction. Shear strength and permeability of compacted soil material affect the performance of embankments.

Sanitary landfill is a method of disposing of solid waste by placing refuse in successive layers either in excavated trenches or on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil material. Landfill areas are subject to heavy vehicular traffic. Risk of polluting ground water and trafficability affect the suitability of a soil for this use. The best soils have a loamy or silty texture, have moderate to slow permeability, are deep to a seasonal water table, and are not subject to flooding. Clayey soils are likely to be sticky and difficult to spread. Sandy or gravelly soils generally have rapid permeability, which might allow noxious liquids to contaminate ground water. Soil wetness can be a limitation because operating heavy equipment on a wet soil is difficult. Seepage into the refuse increases the risk of pollution of ground water.

Ease of excavation affects the suitability of a soil for the trench type of landfill. A suitable soil is deep to bedrock and free of large stones and boulders. If the seasonal water table is high, water will seep into trenches.

Unless otherwise stated, the limitations in table 9 apply only to the soil material within a depth of about 6 feet. If the trench is deeper, a limitation of slight or moderate may not be valid. Site investigation is needed before a site is selected.

Daily cover for landfill should be soil that is easy to excavate and spread over the compacted fill in wet and dry periods. Soils that are loamy or silty and free of stones or boulders are better than other soils. Clayey soils may be sticky and difficult to spread; sandy soils may be subject to soil blowing.

The soils selected for final cover of landfills should be suitable for growing plants. Of all the horizons, the A horizon in most soils has the best workability, more organic matter, and the best potential for growing plants. Thus, for either the area- or trench-type landfill, stockpiling material from the A horizon for use as the surface layer of the final cover is desirable.

If it is necessary to bring in soil material for daily or final cover, thickness of suitable soil material available and depth to a seasonal high water table in soils surrounding the site should be evaluated. Other factors to be evaluated are those that affect reclamation of the borrow areas. These factors include slope, erodibility, and potential for plant growth.

Construction materials

The suitability of each soil as a source of roadfill, sand, gravel, and topsoil is indicated in table 10 by ratings of good, fair, or poor. The texture, thickness, and organic-matter content of each soil horizon are important factors in rating soils for use as construction materials. Each soil is evaluated to the depth observed, generally about 6 feet.

Roadfill is soil material used in embankments for roads. Soils are evaluated as a source of roadfill for low embankments, which generally are less than 6 feet high and less exacting in design than high embankments. The ratings reflect the ease of excavating and working the material and the expected performance of the material where it has been compacted and adequately drained. The performance of soil after it is stabilized with lime or cement is not considered in the ratings, but information about some of the soil properties that influence such performance is given in the descriptions of the soil series.

The ratings apply to the soil material between the A horizon and a depth of 5 to 6 feet. It is assumed that soil horizons will be mixed during excavation and spreading. Many soils have horizons of contrasting suitability within their profile. The estimated engineering properties in table 14 provide specific information about the nature of each horizon. This information can help determine the suitability of each horizon for roadfill.

Soils rated *good* are coarse grained. They have low shrink-swell potential, low frost action potential, and few cobbles and stones. They are at least moderately well drained and have slopes of 15 percent or less. Soils rated *fair* have a plasticity index of less than 15 and have other limiting features, such as moderate shrink-swell potential, moderately steep slopes, wetness, or many stones. If the thickness of suitable material is less than 3 feet, the entire soil is rated *poor.*

Sand and *gravel* are used in great quantities in many kinds of construction. The ratings in table 10 provide guidance as to where to look for probable sources and are based on the probability that soils in a given area contain sizable quantities of sand or gravel. A soil rated *good* or *fair* has a layer of suitable material at least 3 feet thick, the top of which is within a depth of 6 feet. Coarse fragments of soft bedrock material, such as shale and siltstone, are not considered to be sand and gravel. Fine-grained soils are not suitable sources of sand and gravel.

The ratings do not take into account depth to the water table or other factors that affect excavation of the material. Descriptions of grain size, kinds of minerals, reaction, and stratification are given in the soil series descriptions or in table 14.

Topsoil is used in areas where vegetation is to be established and maintained. Suitability is affected mainly by the ease of working and spreading the soil material in preparing a seedbed and by the ability of the soil material to support plantlife. Also considered is the damage that can result at the area from which the topsoil is taken.

The ease of excavation is influenced by the thickness of suitable material, wetness, slope, and amount of stones. The ability of the soil to support plantlife is determined by texture, structure, and the amount of soluble salts or toxic substances. Organic matter in the A1 or Ap horizon greatly increases the absorption and retention of moisture and nutrients. Therefore, the soil material from these horizons should be carefully preserved for later use.

Soils rated *good* have at least 16 inches of friable loamy material at their surface. They are free of stones and cobbles, are low in content of gravel, and have gentle slopes. They are low in soluble salts that can restrict plant growth. They are naturally fertile or respond well to fertilizer. They are not so wet that excavation is difficult during most of the year.

Soils rated *fair* are loose sandy soils or firm loamy or clayey soils in which the suitable material is only 8 to 16 inches thick or soils that have appreciable amounts of gravel, stones, or soluble salt.

Soils rated *poor* are very sandy soils or very firm clayey soils; soils that have suitable layers less than 8 inches thick; soils that have large amounts of gravel, stones, or soluble salt; steep soils; and poorly drained soils.

Although a rating of *good* is not based entirely on high content of organic matter, a surface horizon is generally preferred for topsoil because of its organic-matter content. This horizon is designated as A1 or Ap in the soil series descriptions. The absorption and retention of moisture and nutrients for plant growth are greatly increased by organic matter.

Water management

Many soil properties and site features that affect water management practices have been identified in this soil survey. In table 11 soil and site features that affect use are indicated for each kind of soil. This information is significant in planning, installing, and maintaining water control structures.

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have a low seepage potential, which is determined by permeability and the depth to fractured or permeable bedrock or other permeable material.

Embankments, dikes, and levees require soil material that is resistant to seepage, erosion, and piping and has favorable stability, shrink-swell potential, shear strength, and compaction characteristics. Large stones and organic matter in a soil downgrade the suitability of the soil for use in embankments, dikes, and levees.

Aquifer-fed excavated ponds are bodies of water made by excavating a pit or dugout into a ground-water aquifer. Excluded are ponds that are fed by surface runoff and embankment ponds that impound water 3 feet or more above the original surface. Ratings in table 11 are for ponds that are properly designed, located, and constructed. Soil properties and site features that affect aquifer-fed ponds are depth to a permanent water table, permeability of the aquifer, quality of the water, and ease of excavation.

Drainage of soil is affected by such soil properties as permeability; texture; depth to bedrock, hardpan, or other layers that affect the rate of water movement; depth to the water table; slope; stability of ditchbanks; susceptibility to flooding; salinity and alkalinity; and availability of outlets for drainage.

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to intercept runoff. They allow water to soak into the soil or flow slowly to an outlet. Features that affect suitability of a soil for terraces are uniformity and steepness of slope; depth to bedrock, hardpan, or other unfavorable material; large stones; permeability; ease of establishing vegetation; and resistance to water erosion, soil blowing, soil slipping, and piping.

Grassed waterways are constructed to channel runoff to outlets at a nonerosive velocity. Features that affect the use of soils for waterways are slope, permeability, erodibility, wetness, and suitability for permanent vegetation.

Recreation

The soils of the survey area are rated in table 12 according to limitations that affect their suitability for recreation uses. The ratings are based on such restrictive soil features as flooding, wetness, slope, and texture of the surface layer. Not considered in these ratings, but important in evaluating a site, are location and accessibility of the area, size and shape of the area and its scenic quality, the ability of the soil to support vegetation, access to water, potential water impoundment sites available, and either access to public sewerlines or capacity of the soil to absorb septic tank effluent. Soils subject to flooding are limited, in varying degree, for recreation use by the duration and intensity of flooding and the season when flooding occurs. Onsite assessment of height, duration, intensity, and frequency of flooding is essential in planning recreation facilities.

The degree of the limitation of the soils is expressed as slight, moderate, or severe. *Slight* means that the soil properties are generally favorable and that the limitations are minor and easily overcome. *Moderate* means that the limitations can be overcome or alleviated by planning, design, or special maintenance. *Severe* means that soil properties are unfavorable and that limitations can be offset only by costly soil reclamation, special design, intensive maintenance, limited use, or by a combination of these measures.

The information in table 12 can be supplemented by information in other parts of this survey. Especially helpful are interpretations for septic tank absorption fields, given in table 9, and interpretations for dwellings without basements and for local roads and streets, given in table 8.

Camp areas require such site preparation as shaping and leveling for tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The best soils for this use have mild slopes and are not wet or subject to flooding during the period of use. The surface has few or no stones or boulders, absorbs rainfall readily but remains firm, and is not dusty when dry. Strong slopes and stones or boulders can greatly increase the cost of constructing camping sites.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The best soils for use as picnic areas are firm when wet, are not dusty when dry, are not subject to flooding during the period of use, and do not have slopes or stones or boulders that will increase the cost of shaping sites or of building access roads and parking areas.

Playgrounds require soils that can withstand intensive foot traffic. The best soils are almost level and are not wet or subject to flooding during the season of use. The surface is free of stones or boulders, is firm after rains, and is not dusty when dry. If shaping is required to obtain a uniform grade, the depth of the soil over bedrock or hardpan should be enough to allow necessary grading.

Paths and trails for walking, horseback riding, bicycling, and other uses should require little or no cutting and filling. The best soils for this use are those that are not wet, are firm after rains, are not dusty when dry, and are not subject to flooding more than once during the annual period of use. They have moderate slopes and have few or no stones or boulders on the surface.

Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. The best soils for use as golf fairways are firm when wet, are not dusty when dry, and are not subject to prolonged flooding during the period of use. They should have a surface that is free of stones and boulders and have moderate slopes. Suitability of the soil for traps, tees, or greens was not considered in rating the soils. Irrigation is an assumed management practice.

Wildlife habitat

Timothy N. Dodge, biologist, Soil Conservation Service, helped prepare this section.

Wildlife resources in New Haven County are an important part of the natural environment. They fullfill a variety of human needs including recreation, esthetics, and education.

In New Haven County, as elsewhere, the pressures of urbanization and reversion of openland to woodland are reducing the quality and quantity of available wildlife habitat. These land use changes are causing a shift in population diversity toward smaller animal species, primarily songbirds.

Populations of songbirds and small animals including cotton tail rabbits, raccoon, skunk, opossum, chipmunk, and squirrels are generally high. White-tailed deer, ruffed grouse, woodchuck, and bobwhite quail are also present, as are fox, owls, and hawks.

Ducks, geese, shorebirds, and other waterfowl are common on the many ponds, lakes, and streams in the county. In addition, the waters of Long Island Sound and its environs provide wintering areas for many of these birds.

Soils directly affect the kind and amount of vegetation that is available to wildlife as food and cover, and they affect the construction of water impoundments. The kind and abundance of wildlife that populate an area depend largely on the amount and distribution of food, cover, and water. If any one of these elements is missing, is inadequate, or is inaccessible, wildlife either are scarce or do not inhabit the area.

If the soils have the potential, wildlife habitat can be created or improved by planting appropriate vegetation, by maintaining the existing plant cover, or by helping the natural establishment of desirable plants.

In table 13, the soils in the survey area are rated according to their potential to support the main kinds of wildlife habitat in the area. This information can be used in planning for parks, wildlife refuges, nature study areas, and other developments for wildlife; selecting areas that are suitable for wildlife; selecting soils that are suitable for creating, improving, or maintaining specific elements of wildlife habitat; and determining the intensity of management needed for each element of the habitat.

The potential of the soil is rated good, fair, poor, or very poor. A rating of *good* means that the element of wildlife habitat or the kind of habitat is easily created, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected if the soil is used for the designated purpose. A rating of *fair* means that the element of wildlife habitat or kind of habitat can be created, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of *poor* means that limitations are severe for the designated element or kind of wildlife habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and must be intensive. A rating of *very poor* means that restrictions for the element of wildlife habitat or kind of habitat are very severe and that unsatisfactory results can be expected. Wildlife habitat is impractical or even impossible to create, improve, or maintain on soils having such a rating.

The elements of wildlife habitat are briefly described in the following paragraphs.

Grain and seed crops are seed-producing annuals used by wildlife. The major soil properties that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface stoniness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of grain and seed crops are corn and wheat.

Grasses and legumes are domestic perennial grasses and herbaceous legumes that are planted for wildlife food and cover. Major soil properties that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, flood hazard, and slope. Soil temperature and soil moisture are also considerations. Examples of grasses and legumes are fescue, bromegrass, clover, and alfalfa.

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds, that provide food and cover for wildlife. Major soil properties that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of wild herbaceous plants are bluestem, goldenrod, beggarweed, wheatgrass, and grama.

Hardwood trees and the associated woody understory provide cover for wildlife and produce nuts or other fruit, buds, catkins, twigs, bark, or foliage that wildlife eat. Major soil properties that affect growth of hardwood trees and shrubs are depth of the root zone, available water capacity, and wetness. Examples of hardwood plants are oak, poplar, cherry, sweetgum, apple, hawthorn, dogwood, hickory, blackberry, and blueberry. Examples of fruit-producing shrubs that are commercially available and suitable for planting on soils rated *good* are Russian-olive, autumn-olive, and crabapple.

Coniferous plants are cone-bearing trees, shrubs, or ground cover plants that furnish habitat or supply food in the form of browse, seeds, or fruitlike cones. Soil properties that have a major effect on the growth of coniferous plants are depth of the root zone, available water capacity, and wetness. Examples of coniferous plants are pine, spruce, fir, cedar, and juniper.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites, exclusive of submerged or floating aquatics. They produce food or

cover for wildlife that use wetland as habitat. Major soil properties affecting wetland plants are texture of the surface layer, wetness, reaction, salinity, slope, and surface stoniness. Examples of wetland plants are smartweed, wild millet, wildrice, saltgrass, and cordgrass and rushes, sedges, and reeds.

Shallow water areas are bodies of water that have an average depth of less than 5 feet and that are useful to wildlife. They can be naturally wet areas, or they can be created by dams or levees or by water-control structures in marshes or streams. Major soil properties affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability. The availability of a dependable water supply is important if water areas are to be developed. Examples of shallow water areas are marshes, waterfowl feeding areas, and ponds.

The kinds of wildlife habitat are briefly described in the following paragraphs (*1*).

Openland habitat consists of cropland, pasture, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. The kinds of wildlife attracted to these areas include bobwhite quail, pheasant, meadowlark, field sparrow, cottontail rabbit, and red fox.

Woodland habitat consists of areas of hardwoods or conifers, or a mixture of both, and associated grasses, legumes, and wild herbaceous plants. Wildlife attracted to these areas include ruffed grouse, woodcock, thrushes, woodpeckers, squirrels, raccoon, and deer.

Wetland habitat consists of open, marshy or swampy, shallow water areas where water-tolerant plants grow. Some of the wildlife attracted to such areas are ducks, geese, herons, shore birds, muskrat, mink, and beaver.

Soil properties

Extensive data about soil properties are summarized on the following pages. The two main sources of these data are the many thousands of soil borings made during the course of the survey and the laboratory analyses of selected soil samples from typical profiles.

In making soil borings during field mapping, soil scientists can identify several important soil properties (*8*). They note the seasonal soil moisture condition or the presence of free water and its depth. For each horizon in the profile, they note the thickness and color of the soil material; the texture, or amount of clay, silt, sand, and gravel or other coarse fragments; the structure, or the natural pattern of cracks and pores in the undisturbed soil; and the consistence of the soil material in place under the existing soil moisture conditions. They record the depth of plant roots, determine the pH or reaction of the soil, and identify any free carbonates.

Samples of soil material are analyzed in the laboratory to verify the field estimates of soil properties and to determine all major properties of key soils, especially properties that cannot be estimated accurately by field observation. Laboratory analyses are not conducted for all soil series in the survey area, but laboratory data for many soil series not tested are available from nearby survey areas.

The available field and laboratory data are summarized in tables. The tables give the estimated range of engineering properties, the engineering classifications, and the physical and chemical properties of each major horizon of each soil in the survey area. They also present data about pertinent soil and water features.

Engineering properties

Table 14 gives estimates of engineering properties and classifications for the major horizons of each soil in the survey area.

Most soils have, within the upper 5 or 6 feet, horizons of contrasting properties. Table 14 gives information for each of these contrasting horizons in a typical profile. *Depth* to the upper and lower boundaries of each horizon is indicated. More information about the range in depth and about other properties in each horizon is given for each soil series in the section "Soil series and morphology."

Texture is described in table 14 in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in soil material that is less than 2 millimeters in diameter. "Loam," for example, is soil material that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If a soil contains gravel or other particles coarser than sand, an appropriate modifier is added, for example, "gravelly loam." Other texture terms are defined in the Glossary.

The two systems commonly used in classifying soils for engineering use are the Unified Soil Classification System (*3*) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO) (*2*).

The *Unified* system classifies soils according to properties that affect their use as construction material. Soils are classified according to grain-size distribution of the fraction less than 3 inches in diameter, plasticity index, liquid limit, and organic-matter content. Soils are grouped into 15 classes—eight classes of coarse-grained soils, identified as GW, GP, GM, GC, SW, SP, SM, and SC; six classes of fine-grained soils, identified as ML, CL, OL, MH, CH, and OH; and one class of highly organic soils, identified as Pt. Soils on the borderline between two classes have a dual classification symbol, for example, CL-ML.

The *AASHTO* system classifies soils according to those properties that affect their use in highway construction and maintenance. In this system a mineral soil is classified in one of seven basic groups ranging from

A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines. At the other extreme, in group A-7, are fine-grained soils. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as follows: A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, and A-7-6. As an additional refinement, the desirability of soils as subgrade material can be indicated by a group index number. These numbers range from 0 for the best subgrade material to 20 or higher for the poorest. The estimated classification, without group index numbers, is given in table 14. Also in table 14 the percentage, by weight, of rock fragments more than 3 inches in diameter is estimated for each major horizon. These estimates are determined mainly by observing volume percentage in the field and then converting that, by formula, to weight percentage.

Percentage of the soil material less than 3 inches in diameter that passes each of four sieves (U.S. standard) is estimated for each major horizon. The estimates are based on tests of soils that were sampled in the survey area and in nearby areas and on field estimates from many borings made during the survey.

Liquid limit and *plasticity index* indicate the effect of water on the strength and consistence of soil. These indexes are used in the Unified and AASHTO soil classification systems. They are also used as indicators in making general predictions of soil behavior. Range in liquid limit and in plasticity index is estimated on the basis of test data from the survey area or from nearby areas and on observations of the many soil borings made during the survey.

In some surveys, the estimates are rounded to the nearest 5 percent. Thus, if the ranges of gradation and Atterberg limits extend a marginal amount across classification boundaries (1 or 2 percent), the classification in the marginal zone is omitted.

Physical and chemical properties

Table 15 shows estimated values for several soil characteristics and features that affect behavior of soils in engineering uses. These estimates are given for each major horizon, at the depths indicated, in the typical pedon of each soil. The estimates are based on field observations and on test data for these and similar soils.

Permeability is estimated on the basis of known relationships among the soil characteristics observed in the field—particularly soil structure, porosity, and gradation or texture—that influence the downward movement of water in the soil. The estimates are for vertical water movement when the soil is saturated. Not considered in the estimates is lateral seepage or such transient soil features as plowpans and surface crusts. Permeability of the soil is an important factor to be considered in planning and designing drainage systems, in evaluating the potential of soils for septic tank systems and other waste disposal systems, and in many other aspects of land use and management.

Available water capacity is rated on the basis of soil characteristics that influence the ability of the soil to hold water and make it available to plants. Important characteristics are content of organic matter, soil texture, and soil structure. Shallow-rooted plants are not likely to use the available water from the deeper soil horizons. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design of irrigation systems.

Soil reaction is expressed as a range in pH values. The range in pH of each major horizon is based on many field checks. For many soils, the values have been verified by laboratory analyses. Soil reaction is important in selecting the crops, ornamental plants, or other plants to be grown; in evaluating soil amendments for fertility and stabilization; and in evaluating the corrosivity of soils.

Salinity is expressed as the electrical conductivity of the saturation extract, in millimhos per centimeter at 25 degrees C. Estimates are based on field and laboratory measurements at representative sites of the nonirrigated soils. The salinity of individual irrigated fields is affected by the quality of the irrigation water and by the frequency of water application. Hence, the salinity of individual fields can differ greatly from the value given in table 15. Salinity affects the suitability of a soil for crop production, its stability when used as a construction material, and its potential to corrode metal and concrete.

Shrink-swell potential depends mainly on the amount and kind of clay in the soil. Laboratory measurements of the swelling of undisturbed clods were made for many soils. For others the swelling was estimated on the basis of the kind and amount of clay in the soil and on measurements of similar soils. The size of the load and the magnitude of the change in soil moisture content also influence the swelling of soils. Shrinking and swelling of some soils can cause damage to building foundations, basement walls, roads, and other structures unless special designs are used. A high shrink-swell potential indicates that special design and added expense may be required if the planned use of the soil will not tolerate large volume changes.

Risk of corrosion pertains to potential soil-induced chemical action that dissolves or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to soil moisture, particle-size distribution, total acidity, and electrical conductivity of the soil material. The rate of corrosion of concrete is based mainly on the sulfate content, texture, and acidity of the soil. Protective measures for steel or more resistant concrete help to avoid or minimize damage resulting from the corrosion. Uncoated steel intersecting soil boundaries or soil horizons is more susceptible to corrosion than an

installation that is entirely within one kind of soil or within one soil horizon.

Erosion factors are used to predict the erodibility of a soil and its tolerance to erosion in relation to specific kinds of land use and treatment. The soil erodibility factor (K) is a measure of the susceptibility of the soil to erosion by water. Soils having the highest K values are the most erodible. K values range from 0.10 to 0.64. To estimate annual soil loss per acre, the K value of a soil is modified by factors representing plant cover, grade and length of slope, management practices, and climate. The soil-loss tolerance factor (T) is the maximum rate of soil erosion, whether from rainfall or soil blowing, that can occur without reducing crop production or environmental quality. The rate is expressed in tons of soil loss per acre per year.

Soil and water features

Table 16 contains information helpful in planning land uses and engineering projects that are likely to be affected by soil and water features.

Hydrologic soil groups are used to estimate runoff from precipitation. Soils not protected by vegetation are placed in one of four groups on the basis of the intake of water after the soils have been wetted and have received precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist chiefly of deep, well drained to excessively drained sands or gravels. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils that have a layer that impedes the downward movement of water or soils that have moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clay soils that have a high shrink-swell potential, soils that have a permanent high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

Flooding is the temporary covering of soil with water from overflowing streams, with runoff from adjacent slopes, and by tides. Water standing for short periods after rains or after snow melts is not considered flooding, nor is water in swamps and marshes. Flooding is rated in general terms that describe the frequency and duration of flooding and the time of year when flooding is most likely. The ratings are based on evidence in the soil profile of the effects of flooding, namely thin strata of gravel, sand, silt, or, in places, clay deposited by floodwater; irregular decrease in organic-matter content with increasing depth; and absence of distinctive soil horizons that form in soils of the area that are not subject to flooding. The ratings are also based on local information about floodwater levels in the area and the extent of flooding and on information that relates the position of each soil on the landscape to historic floods.

The generalized description of flood hazards is of value in land-use planning and provides a valid basis for land-use restrictions. The soil data are less specific, however, than those provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

High water table is the highest level of a saturated zone more than 6 inches thick for a continuous period of more than 2 weeks during most years. The depth to a seasonal high water table applies to undrained soils. Estimates are based mainly on the relationship between grayish colors or mottles in the soil and the depth to free water observed in many borings made during the course of the soil survey. Indicated in table 16 are the depth to the seasonal high water table; the kind of water table, that is, perched, artesian, or apparent; and the months of the year that the water table commonly is high. Only saturated zones above a depth of 5 or 6 feet are indicated.

Information about the seasonal high water table helps in assessing the need for specially designed foundations, the need for specific kinds of drainage systems, and the need for footing drains to insure dry basements. Such information is also needed to decide whether or not construction of basements is feasible and to determine how septic tank absorption fields and other underground installations will function. Also, a seasonal high water table affects ease of excavation.

Depth to bedrock is shown for all soils that are underlain by bedrock at a depth of 5 to 6 feet or less. For many soils, the limited depth to bedrock is a part of the definition of the soil series. The depths shown are based on measurements made in many soil borings and on other observations during the mapping of the soils. The kind of bedrock and its hardness as related to ease of excavation is also shown. Rippable bedrock can be excavated with a single-tooth ripping attachment on a 200-horsepower tractor, but hard bedrock generally requires blasting.

Potential frost action refers to the likelihood of damage to pavements and other structures by frost heaving and low soil strength after thawing. Frost action results from the movement of soil moisture into the freezing temperature zone in the soil, which causes ice lenses to form. Soil texture, temperature, moisture content, porosity, permeability, and content of organic matter

are the most important soil properties that affect frost action. It is assumed that the soil is not covered by insulating vegetation or snow and is not artificially drained. Silty and clayey soils that have a high water table in winter are most susceptible to frost action. Well drained very gravelly or sandy soils are the least susceptible.

Classification of the soils

The system of soil classification used by the National Cooperative Soil Survey has six categories (*10*). Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. In this system the classification is based on the different soil properties that can be observed in the field or those that can be inferred either from other properties that are observable in the field or from the combined data of soil science and other disciplines. The properties selected for the higher categories are the result of soil genesis or of factors that affect soil genesis. In table 17, the soils of the survey area are classified according to the system. Categories of the system are discussed in the following paragraphs.

ORDER. Ten soil orders are recognized as classes in the system. The properties used to differentiate among orders are those that reflect the kind and degree of dominant soil-forming processes that have taken place. Each order is identified by a word ending in *sol*. An example is Inceptisol.

SUBORDER. Each order is divided into suborders based primarily on properties that influence soil genesis and are important to plant growth or that are selected to reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Aquept (*Aqu*, meaning water, plus *ept*, from Inceptisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of expression of pedogenic horizons; soil moisture and temperature regimes; and base status. Each great group is identified by the name of a suborder and a prefix that suggests something about the properties of the soil. An example is Haplaquepts (*Hapl*, meaning simple horizons, plus *aquept*, the suborder of Inceptisols that have an aquic moisture regime).

SUBGROUP. Each great group may be divided into three subgroups: the central (typic) concept of the great groups, which is not necessarily the most extensive subgroup; the intergrades, or transitional forms to other orders, suborders, or great groups; and the extragrades, which have some properties that are representative of the great groups but do not indicate transitions to any other known kind of soil. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that is thought to typify the great group. An example is Typic Haplaquepts.

FAMILY. Families are established within a subgroup on the basis of similar physical and chemical properties that affect management. Among the properties considered in horizons of major biological activity below plow depth are particle-size distribution, mineral content, temperature regime, thickness of the soil penetrable by roots, consistence, moisture equivalent, soil slope, and permanent cracks. A family name consists of the name of a subgroup and a series of adjectives. The adjectives are the class names for the soil properties used as family differentiae. An example is coarse-loamy, mixed, acid, mesic Typic Haplaquepts.

SERIES. The series consists of soils that formed in a particular kind of material and have horizons that, except for texture of the surface soil or of the underlying substratum, are similar in differentiating characteristics and in arrangement in the soil profile. Among these characteristics are color, texture, structure, reaction, consistence, and mineral and chemical composition.

Soil series and morphology

In this section, each soil series recognized in the survey area is described in detail. The descriptions are arranged in alphabetic order by series name.

Characteristics of the soil and the material in which it formed are discussed for each series. The soil is then compared to similar soils and to nearby soils of other series. Then a pedon, a small three-dimensional area of soil that is typical of the soil series in the survey area, is described. The detailed descriptions of each soil horizon follow standards in the Soil Survey Manual (*8*). Unless otherwise noted, colors described are for moist soil.

Following the pedon description is the range of important characteristics of the soil series in this survey area. Phases, or map units, of each soil series are described in the section "Soil maps for detailed planning."

Adrian series

The Adrian series consists of sandy or sandy-skeletal, mixed, euic, mesic Terric Medisaprists. These soils are very poorly drained. They have black and very dark grayish brown, decomposed organic layers over very dark gray and gray loamy sand and sand. They formed in organic material over sand or sand and gravel that were derived mainly from gneiss, schist, sandstone, and conglomerate. The Adrian soils are in low depressions and along small slowly moving streams. Slope ranges from 0 to 2 percent but is dominantly less than 1 percent.

Adrian soils are on the same landscape as the very poorly drained Scarboro soils, the poorly drained Walpole soils, and the excessively drained Hinckley and Manchester soils.

Typical pedon of Adrian muck, in an area of Adrian and Palms mucks, in the town of Wolcott, about 1,200 feet southwest of the intersection of Long Swamp Road and Beecher Road:

Oa1—0 to 11 inches; black (10YR 2/1) sapric material (muck); 25 percent fiber, 5 percent rubbed; moderate medium granular structure; very friable; many fine roots; strongly acid; clear wavy boundary.
Oa2—11 to 15 inches; black (10YR 2/1) broken face, very dark brown (10YR 2/2) rubbed, sapric material (muck); 25 percent fiber, 5 percent rubbed; weak thick platy structure; very friable; few fine roots; medium acid; clear wavy boundary.
Oa3—15 to 21 inches; black (10YR 2/1) broken face, very dark brown (10YR 2/2) rubbed, sapric material (muck); 20 percent fiber, 5 percent rubbed; weak thick platy structure; friable; medium acid; clear wavy boundary.
Oa4—21 to 33 inches; very dark grayish brown (10YR 3/2) sapric material (muck); 35 percent fiber, 5 percent rubbed; weak thick platy structure; friable; medium acid; clear wavy boundary.
IIC1—33 to 36 inches; very dark gray (10YR 3/1) loamy sand; massive; very friable; medium acid; clear wavy boundary.
IIC2—36 to 60 inches; gray (10YR 5/1) sand; single grain; loose; 10 percent coarse fragments; slightly acid.

The depth to the IIC horizon ranges from 16 to 50 inches. The organic material is derived mainly from herbaceous plants. Woody fragments of twigs, branches, and logs up to 4 inches in diameter make up 0 to 5 percent of the organic layers. Coarse fragments in the IIC horizon range up to 35 percent. Reaction ranges from strongly acid through slightly acid.

The surface tier has a 10YR hue, value of 2, and chroma of 0 or 1.

The subsurface and bottom tiers have 7.5YR or 10YR hue, value of 2 or 3, and chroma of 0 through 3. Structure is weak thick platy, or the tiers are massive.

The IIC horizon has 10YR or 2.5Y hue, value of 2 through 6, and chroma of 0 through 2. Texture is sand, loamy sand, or the gravelly analogs. The upper 2 to 6 inches of the IIC horizon has a high organic matter content.

Agawam series

The Agawam series consists of coarse-loamy over sandy or sandy-skeletal, mixed, mesic Typic Dystrochrepts. These soils are well drained and have a B horizon of dark brown and dark yellowish brown fine sandy loam over a IIC horizon of yellowish brown gravelly sand. They formed in a loamy mantle over sand and gravel that were derived mainly from gneiss, schist, and phyllite. The Agawam soils are on outwash terraces in the stream valleys. Slope ranges from 0 to 15 percent, but it is dominantly 0 to 8 percent.

Agawam soils are on the landscape in association with the moderately well drained Ninigret soils. They are on the same landscape as the Hinckley soils, which have a coarser textured solum; the Raypol soils, which are poorly drained; and the Haven soils, which have a finer textured solum.

Typical pedon of Agawam fine sandy loam, 0 to 3 percent slopes, in the town of Orange, 2,000 feet north of the intersection of Herbert Street and Coram Lane and 1,000 feet west of Coram Lane on the west side of the railroad tracks:

Ap—0 to 8 inches; dark brown (10YR 3/3) fine sandy loam; weak medium granular structure; friable; common fine roots; 5 percent coarse fragments; medium acid; clear smooth boundary.
B21—8 to 19 inches; dark brown (7.5YR 4/4) fine sandy loam; weak medium subangular blocky structure; friable; common fine roots; 5 percent coarse fragments; medium acid; gradual wavy boundary.
B22—19 to 29 inches; dark yellowish brown (10YR 4/4) fine sandy loam; weak medium subangular blocky structure; friable; common fine roots; 5 percent coarse fragments; medium acid; gradual wavy boundary.
B3—29 to 32 inches; dark yellowish brown (10YR 4/4) sandy loam; massive; friable; few fine roots; 10 percent coarse fragments; medium acid; clear wavy boundary.
IIC—32 to 60 inches; yellowish brown (10YR 5/4) gravelly sand; single grain; loose; 30 percent coarse fragments; medium acid.

The solum is 20 to 35 inches thick. Coarse fragments range from 0 to 10 percent in the solum and from 0 to 35 percent in the IIC horizon. In areas that are not limed, reaction throughout these soils ranges from strongly acid to medium acid.

The Ap and A1 horizons have hue of 10YR, value of 3 or 4, and chroma of 2 or 3.

The B horizon has hue of 5YR through 2.5Y, value of 4 through 6, and chroma of 3 through 6. Texture is fine sandy loam or very fine sandy loam. In places, there is a sandy loam B3 horizon; it is up to 4 inches thick.

The IIC horizon has hue of 10YR or 2.5Y, value of 4 through 6, and chroma of 3 or 4. Texture is loamy sand, sand, or gravelly sand.

Branford series

The Branford series consists of coarse-loamy over sandy or sandy-skeletal, mixed, mesic Typic Dystrochrepts. These soils are well drained and have a reddish brown silt loam B2 horizon over a reddish brown stratified sand and gravel IIC horizon. They formed in a loamy mantle over sand and gravel that were derived mainly

from sandstone, conglomerate, shale, arkose, and basalt. The Branford soils are on outwash terraces in the stream valleys. Slope ranges from 0 to 15 percent, but it is dominantly 0 to 8 percent.

Branford soils are on the landscape in association with the moderately well drained Ellington soils. They are on the same landscape as the excessively drained Manchester soils and the poorly drained Raypol soils.

Typical pedon of Branford silt loam, 0 to 3 percent slopes, in the town of Branford, 1,000 feet west of the intersection of Connecticut Highway 139 and the New Haven Trap Rock Railroad:

Ap—0 to 8 inches; dark reddish brown (5YR 3/3) silt loam; weak medium granular structure; friable; common fine roots; 10 percent coarse fragments; strongly acid; clear smooth boundary.

B21—8 to 18 inches; reddish brown (5YR 4/4) loam; weak medium subangular blocky structure; few fine roots; 10 percent coarse fragments; many worm casts; strongly acid; gradual wavy boundary.

B22—18 to 24 inches; reddish brown (5YR 4/4) loam; weak coarse subangular blocky structure; very friable; few fine roots; 15 percent coarse fragments; strongly acid; clear wavy boundary.

IIC—24 to 60 inches; reddish brown (5YR 4/3) stratified sand and gravel; single grain; loose; 25 percent coarse fragments; strongly acid.

The solum ranges from 20 to 40 inches in thickness, but it is commonly about 25 inches thick. Coarse fragments, including cobblestones, range from 5 to 20 percent in the solum and from 10 to 60 percent in the IIC horizon. Reaction ranges from very strongly acid to medium acid throughout, if the soils are not limed.

The Ap and A1 horizons have hue of 5YR through 10YR and value and chroma of 2 or 3.

The B horizon has hue of 5YR, value of 4 or 5, and chroma of 3 through 6. Texture is silt loam, loam, or fine sandy loam. Structure is weak medium or coarse subangular blocky, or the horizon is massive. Consistence is friable or very friable.

The IIC horizon has hue of 2.5YR or 5YR, value of 4 or 5, and chroma of 3 through 6. Texture is sand, gravelly sand, very gravelly sand, or stratified sand and gravel.

Carlisle series

The Carlisle series consists of euic, mesic Typic Medisaprists. These soils are very poorly drained and have very dark brown, dark reddish brown, and dark brown organic layers. They formed in decomposed organic material. The Carlisle soils are in low depressions on outwash terraces and glacial till plains. Slope ranges from 0 to 2 percent, but it is dominantly less than 1 percent.

Carlisle soils are on the same landscape as the very poorly drained Adrian and Palms soils, the well drained Agawam and Branford soils, and the somewhat excessively drained Hollis and Holyoke soils.

Typical pedon of Carlisle muck in a woodland, in the city of Meriden, 100 yards west of the intersection of Connecticut Route 15 and North Broad Street:

O1—0 to 2 inches; undecomposed and partially decomposed hardwood leaves, twigs, and roots.

Oa1—2 to 6 inches; very dark brown (10YR 2/2) sapric material (muck); 15 percent fiber, 5 percent rubbed; weak medium granular structure; very friable; medium acid; clear wavy boundary.

Oa2—6 to 10 inches; very dark brown (10YR 2/2) ped surfaces, dark brown (7.5YR 3/2) rubbed, sapric material (muck); 20 percent fiber, 5 percent rubbed; weak coarse subangular blocky structure; friable; medium acid; clear wavy boundary.

Oa3—10 to 14 inches; dark reddish brown (5YR 3/3) sapric material (muck); 25 percent fiber, 5 percent rubbed; weak thick platy structure; friable; medium acid; gradual wavy boundary.

Oa4—14 to 29 inches; dark reddish brown (5YR 3/3) sapric material (muck); 40 percent fiber, 5 percent rubbed; weak thick platy structure; friable; medium acid; gradual wavy boundary.

Oa5—29 to 64 inches; dark reddish brown (5YR 3/3) sapric material (muck); 45 percent fiber, 8 percent rubbed; massive; friable; slightly acid; clear wavy boundary.

Oa6—64 to 70 inches; dark brown (10YR 3/3) sapric material (muck); 45 percent fiber, 5 percent rubbed; massive; friable; slightly acid.

The organic layers are more than 51 inches thick. Woody fragments of branches, twigs, and logs up to 6 inches in diameter make up 0 to 15 percent of the layers. Reaction throughout ranges from medium acid to neutral.

The surface tier has hue of 7.5YR or 10YR, value of 2, and chroma of 1 or 2.

The subsurface tier has hue of 5YR through 10YR, value of 2 or 3, and chroma of 0 through 3. Structure is weak coarse subangular blocky or weak thick platy, or the tier is massive. Consistence is friable or very friable.

The bottom tier has hue of 5YR through 10YR, value of 2 or 3, and chroma of 0 through 3. This horizon is commonly massive, but some pedons have weak thick platy or weak coarse subangular blocky structure. Some pedons have layers of hemic materials up to 5 inches thick.

Charlton series

The Charlton series consists of coarse-loamy, mixed, mesic Typic Dystrochrepts. These soils are well drained and nonstony to extremely stony and have a yellowish brown and light olive brown fine sandy loam B horizon over a grayish brown gravelly fine sandy loam C horizon.

They formed in glacial till that was derived mainly from schist and gneiss. The Charlton soils are on broad hilltops, ridgetops, and side slopes. Slope ranges from 3 to 35 percent, but it is dominantly 3 to 15 percent.

Charlton soils are on the landscape in association with the moderately well drained Sutton soils and the poorly drained Leicester soils. They are on the same landscape as the Paxton soils, which have a fragipan at a depth of about 26 inches.

Typical pedon of Charlton fine sandy loam, 3 to 8 percent slopes, in the southeast corner of the town of Middlebury, 450 feet south of Long Meadow Road, 50 feet west of an unnamed dirt road, and 400 feet northeast of a finger of Long Meadow Pond:

O2—1-1/2 inches to 0; partially and well decomposed hardwood forest litter.

A1—0 to 2 inches; dark brown (10YR 3/3) fine sandy loam; weak fine granular structure; very friable; many fine roots; 5 percent rock fragments; very strongly acid; abrupt smooth boundary.

B21—2 to 6 inches; dark brown (7.5YR 4/4) fine sandy loam; weak coarse granular structure; very friable; many fine and medium roots; 5 percent rock fragments; very strongly acid; clear wavy boundary.

B22—6 to 18 inches; yellowish brown (10YR 5/6) fine sandy loam; weak medium subangular blocky structure; very friable; common fine and medium roots; 12 percent rock fragments; very strongly acid; clear wavy boundary.

B23—18 to 26 inches; light olive brown (2.5YR 5/4) fine sandy loam; massive; very friable; 15 percent rock fragments; very strongly acid; abrupt wavy boundary.

C—26 to 60 inches; grayish brown (2.5Y 5/2) gravelly fine sandy loam that has lenses of loamy sand; massive; friable with few firm lenses; few roots; 25 percent rock fragments; strongly acid.

The solum is 20 to 36 inches thick. Rock fragments, including stones and cobbles, range from 5 to 25 percent in the solum and from 5 to 35 percent in the C horizon. Where these soils are not limed, reaction ranges from very strongly acid through medium acid throughout.

The Ap and A1 horizons have hue of 10YR, value of 2 through 4, and chroma of 2 or 3.

The B horizon has hue of 7.5YR through 2.5Y, value of 4 through 6, and chroma of 4 through 6. Texture is fine sandy loam, sandy loam, or the gravelly analogs. Structure is weak medium subangular blocky, or the horizon is massive. Consistence is friable or very friable.

The C horizon has hue of 10YR through 5Y, value of 4 through 6, and chroma of 2 through 4. Texture is fine sandy loam, sandy loam, or the gravelly counterparts. Many profiles have lenses of loamy sand up to 4 inches thick. The C horizon is massive, or it has weak platy structure. Consistence is friable. There are firm lenses up to 4 inches thick in many places.

Cheshire series

The Cheshire series consists of coarse-loamy, mixed, mesic Typic Dystrochrepts. These soils are well drained and nonstony to extremely stony and have a reddish brown fine sandy loam B2 horizon. They formed in glacial till that was derived mainly from sandstone, conglomerate, shale, and some basalt. The Cheshire soils are on broad hilltops, ridgetops, and side slopes. Slope ranges from 3 to 35 percent, but is dominantly 3 to 15 percent.

Cheshire soils are on the landscape in association with the moderately well drained Watchaug, poorly drained Wilbraham, and very poorly drained Menlo soils. They are on the same landscape as the Wethersfield soils, which have a fragipan at a depth of about 25 inches.

Typical pedon of Cheshire fine sandy loam, 3 to 8 percent slopes, in the town of Wallingford, about 50 feet east of Northford Road, and about 500 feet north of the junction of Northford Road and Anderson Road:

Ap—0 to 8 inches; dark brown (7.5YR 3/2) fine sandy loam; weak medium granular structure; friable; common fine roots; 5 percent coarse fragments; strongly acid; clear wavy boundary.

B21—8 to 16 inches; reddish brown (5YR 4/4) fine sandy loam; weak medium subangular blocky structure; friable; few fine roots; 10 percent coarse fragments; medium acid; gradual wavy boundary.

B22—16 to 26 inches; reddish brown (5YR 4/4) fine sandy loam; weak medium subangular blocky structure; very friable; few fine roots; 10 percent coarse fragments; medium acid; clear wavy boundary.

C—26 to 60 inches; reddish brown (2.5YR 4/4) gravelly sandy loam; massive; friable; 20 percent coarse fragments; strongly acid.

The solum is 20 to 36 inches thick. Rock fragments, including stones and cobbles, range from 5 to 25 percent in the solum and from 10 to 30 percent in the C horizon. Where these soils are not limed, reaction ranges from very strongly acid to medium acid throughout.

The Ap and A1 horizons have hue of 5YR through 10YR, value of 3 or 4, and chroma of 2 or 3.

The B horizon has hue of 2.5YR or 5YR, value of 3 through 5, and chroma of 4 through 6. Texture is fine sandy loam, silt loam, or sandy loam. Structure is weak subangular blocky, or the horizon is massive. Consistence is friable or very friable.

The C horizon has hue of 2.5YR or 5YR, value of 4, and chroma of 3 or 4. Texture is fine sandy loam, sandy loam, or the gravelly analogs. The horizon is massive or has weak thick platy structure. Consistence is friable; many profiles have firm discontinuous layers up to 2 inches thick.

Deerfield series

The Deerfield series consists of mixed, mesic Aquic Udipsamments. These soils are moderately well drained and have a dark yellowish brown and yellowish brown, mottled loamy sand B2 horizon over a dark brown and brown, mottled fine sand C horizon. They formed in outwash sand that was derived mainly from gneiss, schist, sandstone, and conglomerate. The Deerfield soils are on broad outwash plains in the larger stream valleys. Slope ranges from 0 to 3 percent.

Deerfield soils are on the landscape in association with the excessively drained Penwood soils and the very poorly drained Scarboro soils. They are on the same landscape as the Manchester soils, which have a greater gravel content, and the Walpole soils, which are poorly drained.

Typical pedon of Deerfield loamy fine sand, in the town of North Haven, about 400 feet west of the intersection of the New Haven City boundary line and Middletown Avenue:

Ap—0 to 8 inches; very dark grayish brown (10YR 3/2) loamy fine sand; weak medium granular structure; very friable; common fine roots; very strongly acid; clear smooth boundary.

B21—8 to 16 inches; dark yellowish brown (10YR 4/4) loamy sand; massive; very friable; few fine roots; strongly acid; gradual wavy boundary.

B22—16 to 28 inches; yellowish brown (10YR 5/4) loamy sand; common fine distinct yellowish red (5YR 5/8) and pinkish gray (7.5YR 6/2) mottles; single grain; loose; few fine roots; strongly acid; gradual wavy boundary.

C1—28 to 34 inches; dark brown (7.5YR 4/4) fine sand; few fine distinct yellowish red (5YR 5/8) and pinkish gray (7.5YR 6/2) mottles; single grain; loose; medium acid; gradual wavy boundary.

C2—34 to 60 inches; brown (7.5YR 5/4) fine sand; few fine distinct pinkish gray (7.5YR 6/2) mottles; single grain; loose; medium acid.

The solum is 22 to 35 inches thick. Coarse fragments range from 0 to 20 percent but are commonly less than 5 percent. Where these soils are not limed, reaction ranges from very strongly acid to medium acid throughout.

The Ap and A1 horizons have hue of 10YR, value of 2 through 4, and chroma of 2 or 3.

The B2 horizon has hue of 10YR, value of 4 or 5, and chroma of 4 through 6. The lower part of the B2 horizon has mottles with chroma of 2 or less. Texture is loamy sand or loamy fine sand. This horizon is massive or single grained. Consistence is very friable or loose.

The C horizon has hue of 7.5YR through 2.5Y, value of 4 through 6, and chroma of 3 or 4. This horizon has mottles with chroma of 2 or less. Texture is fine sand or sand.

Ellington series

The Ellington series consists of coarse-loamy over sandy or sandy-skeletal, mixed, mesic Aquic Dystrochrepts. These soils are moderately well drained and have a reddish brown silt loam and very fine sandy loam B horizon mottled with low chroma mottles above 24 inches. The IIC horizon is dark reddish brown very gravelly sand. These soils formed in a loamy mantle over outwash sand and gravel derived mainly from sandstone, conglomerate, shale, arkose, and basalt. The Ellington soils are on outwash terraces of stream valleys. Slope ranges from 0 to 3 percent.

Ellington soils are on the landscape in association with the well drained Branford soils. They are on the same landscape as the Manchester soils, which have a coarser textured solum and are excessively drained; and the Walpole, Raypol, and Raynham soils, which are poorly drained.

Typical pedon of Ellington silt loam, in the town of Cheshire, on the west side of Cheshire Street about one-half mile south of East Johnson Avenue:

Ap—0 to 8 inches; dark reddish brown (5YR 3/2) silt loam; weak medium granular structure; friable; few fine roots; 5 percent coarse fragments; slightly acid; clear smooth boundary.

B21—8 to 18 inches; reddish brown (5YR 4/4) silt loam; weak medium subangular blocky structure; friable; few fine roots; 5 percent coarse fragments; medium acid; gradual wavy boundary.

B22—18 to 26 inches; reddish brown (5YR 4/4) very fine sandy loam; common medium distinct reddish gray (5YR 5/2) and dark red (5YR 4/6) mottles; massive; friable; 10 percent coarse fragments; strongly acid; abrupt wavy boundary.

IIC—26 to 60 inches; dark reddish brown (5YR 3/4) very gravelly sand; single grain; loose; 50 percent coarse fragments; strongly acid.

The solum ranges from 18 to 40 inches in thickness, but commonly it is about 26 inches thick. Coarse fragments, including cobblestones, range from 3 to 20 percent in the solum and from 35 to 60 percent in the IIC horizon. If lime has not been applied, these soils range from strongly acid to medium acid throughout.

The Ap and A1 horizons have hue of 5YR through 10YR, value of 2 through 4, and chroma of 2 or 3.

The B horizon has hue of 2.5YR or 5YR, value of 4 or 5, and chroma of 3 or 4. This horizon is mottled above a depth of 24 inches; the mottles have chroma of 2 or less. Texture is silt loam, very fine sandy loam, loam, or fine sandy loam. Structure is weak medium subangular blocky, or the horizon is massive. Consistence is friable or very friable.

The IIC horizon has hue of 2.5YR or 5YR, value of 3 through 5, and chroma of 4 through 6. Texture is very gravelly sand or stratified sand and gravel.

Haven series

The Haven series consists of coarse-loamy over sandy or sandy-skeletal, mixed, mesic Typic Dystrochrepts. These soils are well drained and have a B horizon of strong brown and yellowish brown silt loam over a IIC horizon of yellowish brown stratified sand and gravel. They formed in a silt loam or very fine sandy loam mantle over outwash sand and gravel derived mainly from gneiss and schist. The Haven soils are on outwash terraces in stream valleys. Slope ranges from 0 to 8 percent.

Haven soils are on the same landscape as the Agawam soils, which have a coarser textured solum; Ninigret soils, which are moderately well drained; and Walpole and Raypol soils, which are poorly drained.

Typical pedon of Haven silt loam, 0 to 3 percent slopes, in the town of Orange, about 1,400 feet north of the Milford town line and 100 feet east of the railroad tracks near the Housatonic River:

Ap—0 to 9 inches; very dark grayish brown (10YR 3/2) silt loam; weak medium granular structure; friable; common fine roots; 5 percent coarse fragments; strongly acid; abrupt smooth boundary.

B21—9 to 14 inches; strong brown (7.5YR 5/6) silt loam; weak medium subangular blocky structure; friable; few fine roots; 5 percent coarse fragments; strongly acid; gradual wavy boundary.

B22—14 to 27 inches; yellowish brown (10YR 5/6) silt loam; weak medium subangular blocky structure; friable; few fine roots; 5 percent coarse fragments; strongly acid; clear wavy boundary.

B3—27 to 31 inches; yellowish brown (10YR 5/6) gravelly loam; massive; friable; 25 percent coarse fragments; strongly acid; clear wavy boundary.

IIC—31 to 60 inches; yellowish brown (10YR 5/4) stratified sand and gravel; single grain; loose; 45 percent coarse fragments; strongly acid.

The solum is 18 to 36 inches thick. Rock fragments range from 2 to 15 percent in the A and B2 horizons and up to 35 percent in the B3 horizon. Rock fragments, including cobblestones, range from 10 to 65 percent in the IIC horizon. Reaction ranges from very strongly acid through medium acid.

Ap and A1 horizons have hue of 10YR, value of 2 through 4, and chroma of 2 or 3.

The B horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 through 6. Texture of the B2 horizon is silt loam or very fine sandy loam. The B3 horizon is less than 5 inches thick and is loam, sandy loam, or their gravelly analogs. Structure is weak medium subangular blocky, or the horizon is massive. Consistence is friable or very friable.

The IIC horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 4 through 6. Texture is sand, gravelly sand, very gravelly sand, or stratified sand and gravel.

Hinckley series

The Hinckley series consists of sandy-skeletal, mixed, mesic Typic Udorthents. These soils are excessively drained and have a strong brown and brown gravelly sandy loam and gravelly loamy sand B horizon over a yellowish brown stratified sand and gravel C horizon. They formed in glacial outwash deposits of sand and gravel that were derived mainly from gneiss and schist. The Hinckley soils are on outwash terraces of stream valleys. Slope ranges from 0 to 15 percent but is dominantly 0 to 8 percent.

Hinckley soils are on the same landscape as the Penwood soils, which contain less gravel; the Ninigret soils, which are moderately well drained; and the Walpole soils, which are poorly drained.

Typical pedon of Hinckley gravelly sandy loam, 3 to 8 percent slopes, in an old apple orchard in the town of Prospect, about 100 yards east of the Naugatuck town line and 100 feet north of Salem Road:

O1—1 to 1/2 inch; undecomposed grass and deciduous leaves.

O2—1/2 inch to 0; very dark brown (10YR 2/2) partially decomposed grass and deciduous leaves.

Ap—0 to 8 inches; dark brown (10YR 3/3) gravelly sandy loam; weak medium granular structure; very friable; many fine roots; 25 percent coarse fragments; many earthworm casts; medium acid; abrupt wavy boundary.

B21—8 to 13 inches; strong brown (7.5YR 5/6) gravelly sandy loam; weak medium subangular blocky structure; very friable; few fine roots; 25 percent coarse fragments; common earthworm casts; medium acid; gradual wavy boundary.

B22—13 to 16 inches; brown (7.5YR 5/4) gravelly loamy sand; single grain; loose; 30 percent coarse fragments; medium acid; gradual wavy boundary.

C—16 to 60 inches; yellowish brown (10YR 5/6) stratified sand and gravel; single grain; loose; 40 percent coarse fragments; medium acid.

The solum ranges in thickness from 12 to 30 inches, but it is commonly about 18 inches thick. Rock fragments range from 10 to 35 percent in the solum and 35 to 70 percent in the C horizon, including cobblestones. Where these soils are not limed, they are very strongly acid through medium acid throughout.

The Ap and A1 horizons have hue of 10YR, value of 2 through 4, and chroma of 1 through 3.

The B21 horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 through 6. The B22 horizon has

hue of 7.5YR or 2.5Y, value of 4 through 6, and chroma of 4 through 8. Texture of the B horizon is gravelly sandy loam or gravelly loamy sand. Structure is weak medium subangular blocky, or the horizon is single grained. Consistence is very friable or loose.

The C horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 3 through 6. Texture is very gravelly sand or stratified sand and gravel.

Hollis series

The Hollis series consists of loamy, mixed, mesic Lithic Dystrochrepts. These soils are somewhat excessively drained and have a dark brown fine sandy loam B2 horizon over hard unweathered bedrock. They formed in a mantle of glacial till derived mainly from gneiss and schist. Hollis soils are on hilltops, ridges, and knolls of bedrock-controlled glacial till plains. Slopes range from 3 to 35 percent.

Hollis soils are on the same landscape as the Charlton soils, which are more than 40 inches deep to bedrock, and the Sutton soils, which are deep and moderately well drained.

Typical pedon of Hollis fine sandy loam, in an area of Charlton-Hollis fine sandy loams, 3 to 15 percent slopes, in the town of Prospect, about 1,500 feet east of Scott Road and 1,500 feet south of the Waterbury town line:

O1—2 inches to 0; undecomposed and partially decomposed hardwood leaves and twigs.

A1—0 to 3 inches; very dark brown (10YR 2/2) fine sandy loam; weak medium granular structure; friable; many fine and medium roots; 10 percent rock fragments; strongly acid; clear wavy boundary.

B2—3 to 15 inches; dark brown (7.5YR 4/4) fine sandy loam; weak medium subangular blocky structure; friable; many fine and medium roots; 10 percent coarse fragments; strongly acid; abrupt wavy boundary.

R—15 inches; hard, unweathered schist bedrock.

The thickness of the solum and the depth to bedrock range from 10 to 20 inches. Rock fragments range from 2 to 25 percent, including stones and boulders. Reaction ranges from very strongly acid through medium acid.

The Ap and A1 horizons have hue of 10YR, value of 2 through 4, and chroma of 2 or 3.

The B2 horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 through 6. Texture is commonly fine sandy loam but can be sandy loam. Structure is weak medium subangular blocky, or the horizon is massive. Consistence is friable or very friable.

The R horizon is hard unweathered gneiss, schist, basalt, or granite.

Holyoke series

The Holyoke series consists of loamy, mixed, mesic Lithic Dystrochrepts. These soils are shallow and somewhat excessively drained and have a dark reddish brown and reddish brown silt loam B horizon over hard unweathered bedrock. They formed in a mantle of glacial till that was derived mainly from sandstone, conglomerate, shale, and basalt. The Holyoke soils are on hills, ridges, and knolls of bedrock-controlled glacial till plains. Slope ranges from 3 to 35 percent.

Holyoke soils are on the same landscape as the Yalesville soils, which have bedrock at a depth of 20 to 40 inches; Cheshire soils, which are more than 40 inches deep to bedrock; and Wilbraham soils, which are poorly drained.

Typical pedon of Holyoke silt loam, in an area of Holyoke-Rock outcrop complex, 3 to 15 percent slopes, in a mixed hardwood forest in the town of North Branford, about 1.5 miles south of Tommy's Path and 1,200 feet west of Lake Gaillard:

O1—2 inches to 0; decomposed and partially decomposed forest litter of deciduous leaves and twigs.

A1—0 to 2 inches; very dark grayish brown (10YR 3/2) silt loam; weak medium granular structure; friable; many fine and medium roots; 5 percent coarse fragments; strongly acid; clear wavy boundary.

B21—2 to 6 inches; dark reddish brown (5YR 3/4) silt loam; weak medium subangular blocky structure; friable; many fine and medium roots; 5 percent coarse fragments; few earthworm casts; strongly acid; gradual wavy boundary.

B22—6 to 13 inches; reddish brown (5YR 4/4) silt loam; weak medium subangular blocky structure; friable; many fine roots; 10 percent coarse fragments; strongly acid; abrupt smooth boundary.

R—13 inches; hard, unweathered basalt bedrock.

The thickness of the solum and the depth to bedrock range from 10 to 20 inches. Rock fragments, including cobbles and stones, range from 5 to 30 percent. Reaction ranges from very strongly acid to medium acid.

The Ap and A1 horizons have hue of 7.5YR or 10YR, value of 3 or 4, and chroma of 2 or 3.

The B horizon has hue of 2.5YR or 5YR, value of 3 through 5, and chroma of 4 through 6. Texture is silt loam, fine sandy loam, or very fine sandy loam. Structure is weak medium subangular blocky or weak granular. Consistence is friable or very friable.

The underlying bedrock is basalt, conglomerate, sandstone, or shale.

Leicester series

The Leicester series consists of coarse-loamy, mixed, acid mesic Aeric Haplaquepts. These soils are poorly drained and nonstony to extremely stony and have a

grayish brown, light brownish gray, and pale brown, mottled fine sandy loam B horizon over a dark yellowish brown, mottled fine sandy loam C horizon. They formed in loamy glacial till that was derived mainly from gneiss and schist. The Leicester soils are in low-lying wet depressions and in small drainageways of glacial uplands. Slope ranges from 0 to 5 percent but is dominantly less than 3 percent.

Leicester soils are on the landscape in association with the well drained Charlton soils and the moderately well drained Sutton soils. They are on the same landscape as the poorly drained Ridgebury soils, which have a fragipan at a depth of about 19 inches, and the very poorly drained Whitman soils, which have a fragipan at a depth of about 22 inches.

Typical pedon of Leicester fine sandy loam, in an area of Ridgebury, Leicester, and Whitman extremely stony fine sandy loams, in the town of Prospect, about 4,500 feet north of the Prospect-Bethany town line and 300 feet east of Connecticut Highway 69:

O—2 inches to 0; raw hardwood leaves and twigs over partly and well decomposed forest litter.

A1—0 to 6 inches; black (10YR 2/1) fine sandy loam; moderate medium granular structure; friable; common fine and medium roots; 5 percent coarse fragments; strongly acid; clear wavy boundary.

B21g—6 to 9 inches; grayish brown (2.5Y 5/2) fine sandy loam; common medium distinct yellowish red (5YR 5/6) mottles; weak medium subangular blocky structure; friable; common fine and medium roots; 5 percent coarse fragments; strongly acid; gradual wavy boundary.

B22g—9 to 17 inches; light brownish gray (2.5Y 6/2) fine sandy loam; common fine distinct yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; friable; few fine and medium roots; 10 percent coarse fragments; strongly acid; gradual wavy boundary.

B23—17 to 23 inches; pale brown (10YR 6/3) fine sandy loam; many medium distinct yellowish brown (10YR 5/6) and yellowish red (5YR 4/6) mottles; massive; friable; few fine roots; 10 percent coarse fragments; strongly acid; clear wavy boundary.

C1—23 to 32 inches; dark yellowish brown (10YR 4/4) fine sandy loam; many medium distinct yellowish brown (10YR 5/6) and pinkish gray (7.5YR 6/2) mottles; massive; friable; 15 percent coarse fragments; strongly acid; gradual wavy boundary.

C2—32 to 60 inches; dark yellowish brown (10YR 4/4) fine sandy loam; few faint yellowish brown (10YR 5/6) mottles; massive; friable; 15 percent coarse fragments; strongly acid.

The solum is 20 to 36 inches thick. Rock fragments range from 5 to 30 percent in the solum and from 10 to 35 percent in the C horizon, including stones and boulders. These soils range from very strongly acid to medium acid if they have not been limed.

The Ap and A1 horizons have hue of 10YR, value of 2 or 3, and chroma of 1 or 2.

The B2g horizon has hue of 10YR or 2.5Y, value of 4 through 6, and chroma of 1 or 2. The lower part of the B2 horizon has hue of 10YR or 2.5Y, value of 4 through 6, and chroma of 3 or 4. The B2 horizon has distinct or prominent mottles. Texture of the B horizon is fine sandy loam, light loam, sandy loam, or the gravelly analogs. Structure is weak subangular blocky, or the horizon is massive. Consistence is friable or very friable.

The C horizon has hue of 7.5YR through 5Y, value of 4 through 6, and chroma of 2 through 4. Mottles are distinct or prominent and are less abundant with depth. Texture is fine sandy loam, sandy loam, or the gravelly analogs. This horizon is massive, or it has weak thick platy structure. Consistence is friable. There are firm lenses up to 4 inches thick in many places.

Ludlow series

The Ludlow series consists of coarse-loamy, mixed, mesic Typic Fragiochrepts. These soils are moderately well drained and are nonstony to extremely stony. They have a B horizon of reddish brown loam and fine sandy loam that is mottled in the lower part. The Cx horizon is reddish brown, very firm, fine sandy loam. These soils formed in compact glacial till that was derived mainly from Triassic sandstone, conglomerate, shale, and arkose. The Ludlow soils are in concave and slightly depressional areas of drumlins and ridges. Slope ranges from 0 to 15 percent, but it is dominantly 0 to 8 percent.

Ludlow soils are on the landscape in association with the well drained Wethersfield soils, the poorly drained Wilbraham soils, and the very poorly drained Menlo soils. They are on the same landscape as the Watchaug soils, which have a more friable C horizon; the Yalesville soils, which are well drained and have bedrock at a depth of 20 to 40 inches; and the Cheshire soils, which are well drained and have a more friable C horizon.

Typical pedon of Ludlow silt loam, 0 to 3 percent slopes, in the town of Wallingford, about 150 feet southeast of the railroad underpass near the junction of Airline Road and Tamarack Swamp Road:

Ap—0 to 8 inches; dark brown (7.5YR 3/2) silt loam; moderate medium granular structure; friable; many fine roots; 5 percent coarse fragments; strongly acid; abrupt smooth boundary.

B21—8 to 14 inches; reddish brown (5YR 4/4) loam; weak medium subangular blocky structure; friable; common fine roots; 8 percent coarse fragments; strongly acid; gradual wavy boundary.

B22—14 to 28 inches; reddish brown (5YR 5/4) loam; common medium distinct yellowish red (5YR 5/6) and pinkish gray (5YR 6/2) mottles; weak medium

subangular blocky structure; few fine roots; 10 percent coarse fragments; friable; strongly acid; clear wavy boundary.

B23—28 to 30 inches; reddish brown (2.5YR 4/4) fine sandy loam; common medium distinct strong brown (7.5YR 5/8) and pinkish gray (7.5YR 6/2) mottles; massive parting to weak thick platy structure in places; firm; 10 percent coarse fragments; strongly acid; clear wavy boundary.

Cx—30 to 60 inches; reddish brown (2.5YR 4/4) fine sandy loam; common medium distinct strong brown (7.5YR 5/8) and pinkish gray (7.5YR 6/2) mottles in the upper 14 inches; weak thick platy structure; very firm; 12 percent coarse fragments; strongly acid.

The thickness of the solum corresponds to the depth of the fragipan and ranges from 20 to 36 inches. Rock fragments, including stones and cobbles, range from 5 to 20 percent in the solum and from 10 to 35 percent in the Cx horizon. These soils range from very strongly acid to medium acid in the solum and from very strongly acid to slightly acid in the Cx horizon.

The Ap and A1 horizons have hue of 7.5YR or 10YR, value of 2 through 4, and chroma of 1 through 3.

The B horizon has hue of 2.5YR or 5YR, value of 4 or 5, and chroma of 4 through 6. This horizon has mottles below a depth of 12 inches. Texture is silt loam, loam, or fine sandy loam. Structure is weak medium subangular blocky, or the horizon is massive. Consistence is friable or very friable.

The Cx horizon has hue of 2.5YR or 5YR, value of 4 or 5, and chroma of 4 through 6. It is mottled in the upper part; the mottles are less abundant with depth. Texture is loam, silt loam, fine sandy loam, or the gravelly analogs. This horizon has weak thick platy structure, or it is massive. Consistence is firm or very firm and brittle.

Manchester series

The Manchester series consists of sandy-skeletal, mixed, mesic Typic Udorthents. These soils are excessively drained and have a yellowish red gravelly sandy loam and gravelly loamy sand B horizon over a reddish brown stratified sand and gravel C horizon. They formed in glacial outwash deposits of sand and gravel that were derived mainly from Triassic sandstone, conglomerate, and basalt. The Manchester soils are on outwash terraces of stream valleys. Slope ranges from 0 to 15 percent.

Manchester soils are on the same landscape as the Branford soils, which have a finer textured solum; the Penwood soils, which formed in sandy outwash and contain less gravel; and the Ellington soils, which have a finer textured solum and are moderately well drained.

Typical pedon of Manchester gravelly sandy loam, 0 to 3 percent slopes, in the town of Prospect, 0.7 mile south of Cook Road and 100 feet west of Roaring Brook Road:

O—1 inch to 0; fresh and partly decomposed leaf litter.

Ap—0 to 6 inches; reddish brown (5YR 4/3) gravelly sandy loam; weak medium granular structure; very friable; many fine and medium roots; 20 percent coarse fragments; strongly acid; clear wavy boundary.

B21—6 to 10 inches; yellowish red (5YR 4/8) gravelly sandy loam; massive; very friable; few fine and medium roots; 25 percent coarse fragments; strongly acid; clear wavy boundary.

B22—10 to 16 inches; yellowish red (5YR 4/6) gravelly loamy sand; single grain; loose; few roots; 30 percent coarse fragments; strongly acid; gradual wavy boundary.

C—16 to 60 inches; reddish brown (5YR 5/4) sand and gravel; single grain; loose; few fine roots; 50 percent coarse fragments; strongly acid.

The solum is 12 to 22 inches thick. Coarse fragments, including cobblestones, range from 15 to 35 percent in the solum and from 35 to 70 percent in the C horizon. Reaction throughout these soils ranges from very strongly acid to medium acid.

The Ap and A1 horizons have hue of 5YR through 10YR, value of 3 or 4, and chroma of 1 through 3.

The B2 horizon has hue of 2.5YR or 5YR, value of 4 or 5, and chroma of 4 through 8. Texture is sandy loam or gravelly sandy loam in the upper part and gravelly loamy sand in the lower part. Structure is weak medium granular, or the horizon is massive or single grained. Consistence is very friable or loose.

The C horizon has hue of 2.5YR or 5YR, value of 4 or 5, and chroma of 4 through 8. Texture is very gravelly sand or stratified sand and gravel.

Menlo series

The Menlo series consists of coarse-loamy, mixed, mesic Aeric Fragiaquepts. These soils are very poorly drained and have a gray, faintly mottled silt loam A2 horizon over a weak red mottled loam B horizon over a reddish brown mottled very firm loam and gravelly loam Cx horizon. They formed in loamy, compact glacial till that was derived mainly from sandstone, conglomerate, arkose, and shale. The Menlo soils are on concave side slopes along drainageways and in low depressions on glacial uplands. Slope ranges from 0 to 3 percent.

Menlo soils are associated on the landscape with well drained Wethersfield soils, moderately well drained Ludlow soils, and poorly drained Wilbraham soils. They are on the same landscape as the well drained Cheshire soils and the moderately well drained Watchaug soils, which have a more friable C horizon, the Yalesville soils, which have bedrock at a depth of 20 to 40 inches, and

the Holyoke soils, which have bedrock at a depth of 10 to 20 inches.

Typical pedon of Menlo silt loam, in an area of Wilbraham and Menlo extremely stony silt loams, in the town of Wallingford, 1 mile southeast of MacKenzie Reservoir and 200 yards north of the intersection of Northford Road and Cook Road:

O2—3 inches to 0; black (10YR 2/1) muck; weak medium granular structure; friable; strongly acid; clear wavy boundary.

A1—0 to 5 inches; black (10YR 2/1) silt loam; moderate medium granular structure; friable; common fine roots; strongly acid; abrupt wavy boundary.

A2g—5 to 8 inches; gray (5YR 5/1) silt loam; few fine faint dark red (2.5YR 3/6) mottles; weak medium platy structure; friable; few fine roots; 2 percent coarse fragments; medium acid; clear wavy boundary.

B2—8 to 22 inches; weak red (2.5YR 4/2) loam; common medium distinct yellowish red (5YR 4/6) mottles; weak medium subangular blocky structure; friable; few fine roots; 5 percent coarse fragments; medium acid; gradual wavy boundary.

C1x—22 to 30 inches; reddish brown (2.5YR 4/4) loam; common medium distinct yellowish red (5YR 4/6) and weak red (2.5YR 4/2) mottles; weak thick platy structure; very firm, brittle; 10 percent coarse fragments; medium acid; gradual wavy boundary.

C2x—30 to 60 inches; reddish brown (2.5YR 4/4) gravelly loam; few fine faint yellowish red (5YR 4/6) and weak red (2.5YR 4/2) mottles; weak thick platy structure; very firm, brittle; 25 percent coarse fragments; medium acid.

The thickness of the solum ranges from 18 to 30 inches and corresponds to the depth of the fragipan. Rock fragments range from 0 to 15 percent in the solum and from 10 to 35 percent in the substratum; the fragments include stones and cobbles. Reaction ranges from very strongly acid to slightly acid in the fragipan.

Many pedons have up to 6 inches of muck on the surface. The Ap and A1 horizons have hue of 10YR, value of 2 or 3, and chroma of 1.

The A2 horizon has hue of 5YR through 10YR, value of 5 or 6, and chroma of 1 or 2. Texture is silt loam, loam, or fine sandy loam. Structure is weak platy, or the horizon is massive.

The B horizon has hue of 2.5YR or 5YR, value of 4 or 5, and chroma of 2 through 4. Mottles are distinct or prominent. Texture is silt loam, fine sandy loam, or loam. Structure is weak medium subangular blocky, or the horizon is massive.

The Cx horizon has hue of 2.5YR or 5YR, value of 4 or 5, and chroma of 3 through 6. Texture is loam, fine sandy loam, or the gravelly analogs. Structure is weak thick platy, or the horizon is massive. Consistence is firm or very firm and brittle.

Ninigret series

The Ninigret series consists of coarse-loamy over sandy or sandy-skeletal, mixed, mesic Aquic Dystrochrepts. These soils are moderately well drained and have a B horizon of dark yellowish brown and yellowish brown mottled fine sandy loam and gravelly fine sandy loam over a IIC horizon of brown stratified sand and gravel. They formed in a loamy mantle over stratified sand and gravel that derived mainly from gneiss and schist. The Ninigret soils are in slight depressions on outwash terraces of stream valleys. Slope ranges from 0 to 3 percent.

Ninigret soils are associated on the landscape with the well drained Agawam soils. They are on the same landscape as the well drained Haven soils, the excessively drained Hinckley soils, and the poorly drained Walpole and Raypol soils.

Typical pedon of Ninigret fine sandy loam, in the town of Middlebury, about 0.6 miles north of Breakneck Hill Road and 800 feet east of Watertown Road in a grass field:

Ap—0 to 8 inches; dark brown (10YR 3/3) fine sandy loam; weak medium granular structure; friable; common fine roots; 5 percent coarse fragments; medium acid; abrupt smooth boundary.

B21—8 to 15 inches; dark yellowish brown (10YR 4/4) fine sandy loam; weak medium subangular blocky structure; friable; common fine roots; 5 percent coarse fragments; gradual wavy boundary.

B22—15 to 23 inches; yellowish brown (10YR 5/4) fine sandy loam; common fine distinct grayish brown (10YR 5/2) and yellowish brown (10YR 5/6) mottles; weak medium granular structure; friable; few fine roots; 10 percent coarse fragments; medium acid; clear wavy boundary.

B3—23 to 25 inches, yellowish brown (10YR 5/4) gravelly fine sandy loam; common medium distinct light grayish brown (10YR 6/2) and yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; friable; 20 percent coarse fragments; medium acid; clear wavy boundary.

IIC—25 to 60 inches; brown (10YR 5/3) stratified sand and gravel; single grain; loose; 25 percent coarse fragments; medium acid.

The solum is 20 to 40 inches thick. Coarse fragments, including cobblestones, range from 0 to 10 percent in the solum and from 0 to 30 percent in the IIC horizon. Reaction ranges from very strongly acid to strongly acid.

The Ap and A1 horizons have hue of 10YR, value of 2 through 4, and chroma of 1 through 3.

The B21 horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 through 6. The B22 horizon has

hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 4 through 6. Texture is fine sandy loam or very fine sandy loam. The B horizon has mottles that have chroma of 2 or less above a depth of 24 inches. Structure is weak medium subangular blocky, or the horizon is massive. Consistence is friable or very friable.

The IIC horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 3 through 6. Texture is sand or stratified sand and gravel.

Palms series

The Palms series consists of loamy, mixed, euic, mesic Terric Medisaprists. These soils are very poorly drained and have black, dark brown, and very dark grayish brown decomposed organic layers over a dark gray gravelly silt loam IIC horizon. They formed in organic material over loamy material that derived mainly from gneiss, schist, sandstone, and conglomerate. The Palms soils are in low depressions and along small slowly moving streams. Slope ranges from 0 to 3 percent but is dominantly less than 1 percent.

Palms soils are on the same landscape as the very poorly drained Whitman and Menlo soils and the poorly drained Ridgebury, Wilbraham, and Raynham soils.

Typical pedon of Palms muck, in an area of Adrian and Palms mucks, in the town of Guilford, in a woodlot south of Highway 80, east of Iron Road, and about 500 feet northeast of the northern end of West Lake:

Oa1—0 to 8 inches; black (10YR 2/1) sapric material (muck); 25 percent fiber, 5 percent rubbed; weak medium granular structure; friable; many live roots; medium acid; clear wavy boundary.

Oa2—8 to 13 inches; black (10YR 2/1) and very dark brown (10YR 2/2) sapric material (muck); 25 percent fiber, 5 percent rubbed; weak medium granular structure; friable; medium acid; clear wavy boundary.

Oa3—13 to 19 inches; black (10YR 2/1) sapric material (muck); 25 percent fiber, 5 percent rubbed; weak coarse subangular blocky structure; friable; 3 percent coarse fragments of wood less than 1/2 inch in diameter; strongly acid; clear wavy boundary.

Oa4—19 to 23 inches; very dark grayish brown (10YR 3/2) sapric material (muck); 40 percent fiber, 8 percent rubbed; weak thick platy structure; friable; strongly acid; clear wavy boundary.

Oa5—23 to 32 inches; dark brown (10YR 3/3) sapric material (muck); 65 percent fiber, 8 percent rubbed; weak thick platy structure; friable; slightly acid; gradual wavy boundary.

IIC—32 to 60 inches; dark gray (5Y 4/1) gravelly silt loam; massive; friable; 20 percent coarse fragments; neutral.

The depth to the IIC horizon ranges from 16 to 50 inches. The organic material is derived mainly from herbaceous plants. Woody fragments of twigs, branches, and logs up to 4 inches in diameter make up 0 to 5 percent of the organic layers. Coarse fragments in the IIC horizon range from 0 to 25 percent. Reaction ranges from medium acid to neutral in the organic layers and from slightly acid to neutral in the IIC horizon.

The surface tier has hue of 10YR, value of 2, and chroma of 1 or 2.

The subsurface and bottom tiers have hue of 7.5YR through 10YR, value of 2 or 3, and chroma of 1 through 3. Structure is weak thick platy or weak coarse subangular blocky, or the tiers are massive. Consistence is friable or very friable.

The IIC horizon has hue of 10YR through 5Y, value of 4 through 6, and chroma of 1 or 2. Texture is fine sandy loam, loam, silt loam, or the gravelly analogs. This horizon is massive. Consistence ranges from friable to firm.

Paxton series

The Paxton series consists of coarse-loamy, mixed, mesic Typic Fragiochrepts. These soils are well drained, nonstony to extremely stony and have a dark yellowish brown and olive brown fine sandy loam B horizon over an olive gravelly fine sandy loam Cx horizon. They formed in compact glacial till that was derived mainly from gneiss and schist. The Paxton soils are on drumloidal shaped hills, ridges, and side slopes. Slope ranges from 3 to 35 percent but is dominantly 3 to 15 percent.

Paxton soils are associated on the landscape with the moderately well drained Woodbridge soils, the poorly drained Ridgebury soils, and the very poorly drained Whitman soils. They are on the same landscape as the Charlton soils, which have a more friable C horizon; and the Hollis soils, which have bedrock at a depth of 10 to 20 inches.

Typical pedon of Paxton fine sandy loam, 3 to 8 percent slopes, in the town of Prospect, 0.4 mile east of Straitsville Road and 0.5 mile north of the Bethany Town Line:

Ap—0 to 8 inches; dark brown (10YR 3/3) fine sandy loam; moderate medium granular structure; friable; many fine roots; 5 percent coarse fragments; strongly acid; abrupt smooth boundary.

B21—8 to 15 inches; dark yellowish brown (10YR 4/4) fine sandy loam; weak medium subangular blocky structure; friable; common fine roots; 5 percent coarse fragments; few earthworm casts; strongly acid; gradual wavy boundary.

B22—15 to 26 inches; olive brown (2.5Y 4/4) fine sandy loam; weak medium subangular blocky structure; friable; few fine roots; 10 percent coarse fragments; strongly acid; clear wavy boundary.

Cx—26 to 60 inches; olive (5Y 5/3) gravelly fine sandy loam; moderate thick platy structure; very firm; 25 percent coarse fragments; many oxide coatings; strongly acid.

The solum is 18 to 36 inches thick. Rock fragments, including stones and cobbles, range from 5 to 30 percent in the solum and from 5 to 45 percent in the C horizon. These soils are strongly acid to slightly acid.

The Ap and A1 horizons have hue of 10YR and value and chroma of 2 through 4.

The B21 horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 through 6. The B22 horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 3 through 6. Texture of the B horizon is fine sandy loam, loam, or the gravelly analogs. Structure is weak medium subangular blocky. Consistence is friable or very friable.

The Cx horizon has hue of 2.5Y or 5Y, value of 4 through 6, and chroma of 3 or 4. Texture is fine sandy loam, sandy loam, or the gravelly analogs. This horizon has weak or moderate thick platy structure, or it is massive. Consistence is firm or very firm with brittleness. Oxide coatings are common in the Cx horizon.

Penwood series

The Penwood series consists of mixed, mesic Typic Udipsamments. These soils are deep, excessively drained and have a yellowish red loamy sand and reddish brown sand B horizon over a reddish brown sand C horizon. They formed on sandy outwash terraces in material that was derived mainly from sandstone, shale, conglomerate, and basalt. The Penwood soils are on broad outwash terraces. Slope ranges from 0 to 15 percent but is dominantly 0 to 8 percent.

Penwood soils are associated on the landscape with the moderately well drained Deerfield soils. They are on the same landscape as the Walpole soils, which are poorly drained, the Manchester soils, which are excessively drained and gravelly throughout, and the Branford soils, which are well drained and have a finer textured solum.

Typical pedon of Penwood loamy sand, 3 to 8 percent slopes, in the town of East Haven, 1 mile north of Interchange 52 of the Connecticut Turnpike, on the east side of North High Street just south of the State Rifle Range:

Ap—0 to 8 inches, dark brown (7.5YR 3/2) loamy sand; weak medium granular structure; very friable; many fine roots; strongly acid; clear smooth boundary.

B21—8 to 18 inches; yellowish red (5YR 4/6) loamy sand; single grain; loose; common fine roots; strongly acid; gradual wavy boundary.

B22—18 to 30 inches; reddish brown (5YR 4/4) sand; single grain; loose; few fine roots; strongly acid; gradual wavy boundary.

C—30 to 60 inches; reddish brown (5YR 5/3) medium sand with thin layers of fine sand; single grain; loose; strongly acid.

The solum is 20 to 36 inches thick. Coarse fragments range from 0 to 5 percent in the solum and from 0 to 10 percent in the C horizon. Reaction throughout these soils ranges from very strongly acid to slightly acid.

The Ap and A1 horizons have hue of 7.5YR or 10YR and value and chroma of 2 through 4.

The B horizon has hue of 5YR, value of 4 or 5, and chroma of 4 through 6. Texture is loamy sand or loamy fine sand in the upper part grading to medium or fine sand in the lower part.

The C horizon has hue of 5YR or 7.5YR, value of 4 or 5, and chroma of 4 through 6. Texture is sand or fine sand.

Podunk series

The Podunk series consists of coarse-loamy, mixed, mesic Fluvaquentic Dystrochrepts. These soils are moderately well drained and have a brown and dark brown fine sandy loam and sandy loam B horizon over a yellowish brown sand C horizon. They formed in recent alluvium that was derived mainly from gneiss and schist. The Podunk soils are on flood plains of the larger streams. Slope ranges from 0 to 3 percent.

Podunk soils are associated on the landscape with the poorly drained Rumney soils. They are on the same landscape as the Saco soils, which are very poorly drained and formed in finer textured alluvium, the Scarboro soils, which are very poorly drained and formed in sandy outwash, and the Agawam and Haven soils, which are well drained and formed on adjacent outwash plains and terraces.

Typical pedon of Podunk fine sandy loam, in a woodlot in the town of Southbury on the east side of the Pomperaug River about 2,500 feet south of East Flat Hill Road:

O1—2 inches to 1 inch; undecomposed deciduous leaves and twigs.

O2—1 inch to 0; decomposed organic matter with some partially decomposed leaves and twigs.

A1—0 to 5 inches; very dark grayish brown (10YR 3/2) fine sandy loam; weak medium granular structure; friable; many fine and medium roots; strongly acid; clear wavy boundary.

B21—5 to 14 inches; brown (10YR 5/3) fine sandy loam; weak fine granular structure; very friable; many fine and medium roots; strongly acid; clear wavy boundary.

B22—14 to 34 inches; dark brown (10YR 3/3) sandy loam; common fine distinct grayish brown (10YR 5/2) and yellowish brown (10YR 5/4) mottles; weak fine granular structure; very friable; few medium and fine roots; strongly acid; clear wavy boundary.

C—34 to 60 inches; yellowish brown (10YR 5/4) sand with strata of gravel 2 inches thick; single grain; loose; 10 percent coarse fragments; medium acid.

The solum is 20 to 36 inches thick. The content of rock fragments is 0 to 5 percent in the solum and 0 to

15 percent in the C horizon. These soils are very strongly acid to medium acid throughout.

The Ap or A1 horizon has hue of 10YR, value of 3 or 4, and chroma of 2 or 3.

The B horizon has hue of 10YR or 2.5Y and value and chroma of 3 through 6. It has mottles that have chroma of 2 or less above a depth of 24 inches. Texture is fine sandy loam or sandy loam. Structure is weak or moderate fine granular. Consistence is friable or very friable.

The C horizon has hue of 10YR or 2.5Y, value of 4 through 6, and chroma of 3 through 6. Texture is sand, loamy sand or loamy fine sand with strata of gravel up to 4 inches thick.

Podunk Variant

The Podunk Variant consists of coarse-loamy over sandy or sandy-skeletal, mixed, mesic Fluventic Dystrochrepts. These soils are moderately well drained and have a reddish brown silt loam B horizon over a reddish brown silt loam C horizon over a dark gray sand IIC horizon. They formed in recent alluvium derived mainly from sandstone, conglomerate, arkose, and shale. These soils are on flood plains of the larger streams. Slope ranges from 0 to 3 percent.

Podunk Variant soils are on the landscape in association with the poorly drained Rumney Variant soils. They are on the same landscape as the Branford and Ellington soils, which formed in a loamy mantle over sand and gravel, and the excessively drained Manchester soils, which are on outwash terraces.

Typical pedon of Podunk Variant silt loam, in the town of Branford, 1/4 mile southeast of the intersection of Connecticut Highway 139 and Valley Road:

Ap—0 to 9 inches; dark brown (7.5YR 3/2) silt loam; weak medium granular structure; friable; many roots; medium acid; clear smooth boundary.

B21—9 to 12 inches; reddish brown (5YR 4/3) silt loam; weak medium subangular blocky structure; friable; many roots; medium acid; gradual wavy boundary.

B22—12 to 19 inches; reddish brown (5YR 4/4) silt loam; weak medium subangular blocky structure; friable; few roots; medium acid; gradual wavy boundary.

B23—19 to 26 inches; reddish brown (5YR 4/4) silt loam; few fine faint yellowish red (5YR 5/6) mottles; weak medium subangular blocky structure; friable; medium acid; gradual wavy boundary.

C1—26 to 36 inches; reddish brown (5YR 4/4) silt loam; common medium distinct yellowish red (5YR 5/6) and light reddish brown (5YR 6/3) mottles; massive; friable; medium acid; clear wavy boundary.

IIC2—36 to 42 inches; dark gray (N 4/) medium sand; single grain; loose; medium acid.

The solum is 25 to 35 inches thick. The depth to sand or sand and gravel ranges from 25 to 40 inches. Rock fragments range from 0 to 3 percent in the solum and C1 horizon and from 0 to 25 percent in the IIC horizon. Reaction throughout these soils ranges from very strongly acid to medium acid.

The Ap and A1 horizons have hue of 7.5YR or 10YR, value of 2 through 4, and chroma of 1 through 3.

The B horizon has hue of 2.5YR or 5YR, value of 3 through 5, and chroma of 3 or 4. It has mottles in the lower part. Texture is silt loam or very fine sandy loam. Structure is weak medium subangular blocky, or the horizon is massive. Consistence is friable or very friable.

The C1 horizon, where it occurs, has hue of 2.5YR or 5YR, value of 3 through 5, and chroma of 4 or 5. This horizon is mottled. Texture is silt loam or very fine sandy loam. The IIC horizon has hue of 5YR through 10YR or is neutral, value of 4 through 6, and chroma of 0 through 4. Texture is sand, loamy sand, or stratified sand and gravel.

Raynham series

The Raynham series consists of coarse-silty, mixed, nonacid, mesic Aeric Haplaquepts. These soils are poorly drained and have a light brownish gray and reddish brown, mottled silt loam and very fine sandy loam B horizon over a reddish brown and dark reddish brown, mottled silt loam and very fine sandy loam C horizon. They formed in a mantle of coarse silt and very fine sand that derived mainly from gneiss, schist, sandstone, conglomerate, and shale. In this survey area, the Raynham soils are a taxadjunct because they have redder colors and are more acid than defined for the Raynham series. The Raynham soils are in low depressions on outwash plains and terraces. Slope ranges from 0 to 3 percent.

Raynham soils are associated on the landscape with the moderately well drained Scio soils. They are on the same landscape as the well drained Branford, Haven, and Agawam soils, which are on adjacent outwash plains and terraces; the moderately well drained Ellington and Ninigret soils on adjacent outwash plains and terraces; and the Raypol and Walpole soils, which are underlain by sand or sand and gravel within a depth of 40 inches.

Typical pedon of Raynham silt loam, in the town of Wallingford, about 0.5 mile north of Scard Road and 100 feet east of Williams Road:

Ap—0 to 6 inches; very dark grayish brown (10YR 3/2) silt loam; weak medium subangular blocky structure; friable; common fine and medium roots; strongly acid; clear smooth boundary.

B21g—6 to 11 inches; light brownish gray (10YR 6/2) very fine sandy loam; common fine distinct yellowish brown (10YR 5/6) mottles; weak thin platy structure; friable; common fine and medium roots; medium acid; clear wavy boundary.

B22—11 to 23 inches; reddish brown (5YR 4/4) silt loam; moderate medium distinct strong brown (7.5YR 5/6) and pinkish gray (7.5YR 6/2) mottles; weak medium subangular blocky structure; friable; very fine sand coatings on vertical ped faces; few fine roots; medium acid; gradual wavy boundary.

C1—23 to 32 inches; reddish brown (5YR 4/4) silt loam; common medium distinct strong brown (7.5YR 5/6) and light reddish brown (5YR 6/3) mottles; massive; friable; slightly acid; gradual wavy boundary.

C2—32 to 60 inches; dark reddish brown (5YR 3/4) very fine sandy loam; few medium distinct strong brown (7.5YR 5/6) mottles; massive; friable; neutral.

The solum is 16 to 34 inches thick. The content of rock fragments is 0 to 2 percent in the solum and in the C horizon. Reaction ranges from strongly acid to slightly acid in the solum and from medium acid to neutral in the C horizon.

The Ap or A1 horizon has hue of 7.5YR or 10YR, value of 2 or 3, and chroma of 1 through 3.

The B horizon has hue of 5YR through 2.5Y, value of 4 through 6, and chroma of 2 through 4. This horizon has distinct or prominent mottles. Texture is silt loam or very fine sandy loam. Structure is weak platy or weak medium subangular blocky. Consistence is friable or very friable.

The C horizon has hue of 5YR through 2.5Y, value of 4 through 6, and chroma of 2 through 4. This horizon has distinct or prominent mottles. The mottles are less abundant with depth. Texture is silt loam or very fine sandy loam. Many pedons have a layer of fine sand or loamy fine sand up to 2 inches thick. Consistence is friable or very friable.

Raypol series

The Raypol series consists of coarse-loamy over sandy or sandy-skeletal, mixed, acid, mesic Aeric Haplaquepts. These soils are poorly drained and have a grayish brown, dark yellowish brown, and olive brown mottled silt loam and very fine sandy loam B horizon over a light olive brown mottled gravelly sand IIC horizon. They formed in a mantle of silt loam or very fine sandy loam over sand, gravelly sand, or stratified sand and gravel—materials that were derived mainly from gneiss, schist, sandstone, conglomerate, shale, and arkose. The Raypol soils are in depressions on outwash plains and terraces. Slopes range from 0 to 3 percent.

Raypol soils are on the same landscape as the well drained Branford, Haven, and Agawam soils; the moderately well drained Ellington and Ninigret soils; the poorly drained Walpole soils, which have a coarser textured solum; and the poorly drained Raynham soils, which do not have coarse textured sand or gravel within a depth of 40 inches.

Typical pedon of Raypol silt loam, in the town of Milford, about 800 feet east of Derby Milford Road and 400 feet north of the service area on the Wilbur Cross Parkway near the edge of an open field:

Ap—0 to 8 inches; very dark brown (10YR 2/2) silt loam; weak medium granular structure; friable; common fine and medium roots; strongly acid; clear wavy boundary.

B21—8 to 12 inches; grayish brown (10YR 5/2) very fine sandy loam; common medium distinct yellowish brown (10YR 5/8) mottles; weak medium subangular blocky structure; friable; common fine and medium roots; strongly acid; clear wavy boundary.

B22—12 to 20 inches; grayish brown (10YR 5/2) silt loam; common medium distinct yellowish brown (10YR 5/8) mottles; weak medium subangular blocky structure; friable; common fine and medium roots; strongly acid; clear wavy boundary.

B23—20 to 26 inches; dark yellowish brown (10YR 4/4) silt loam; common medium distinct yellowish brown (10YR 5/8) and light brownish gray (10YR 6/2) mottles; weak medium subangular blocky structure; friable; few fine roots; strongly acid; gradual wavy boundary.

B3—26 to 29 inches; olive brown (2.5Y 4/4) very fine sandy loam; common medium distinct yellowish brown (10YR 5/8) and light brownish gray (10YR 6/2) mottles; massive; friable; 5 percent coarse fragments; strongly acid; clear wavy boundary.

IIC—29 to 60 inches; light olive brown (2.5Y 5/4) gravelly sand; few medium distinct yellowish brown (10YR 5/8) mottles; single grain; loose; 25 percent coarse fragments; strongly acid.

The solum is 18 to 32 inches thick. The depth to sand and gravel ranges from 18 to 40 inches. Coarse fragments range from 0 to 10 percent in the solum and C1 horizon and from 10 to 50 percent in the IIC horizon. Where lime has not been applied, reaction is very strongly acid or strongly acid to a depth of 40 inches and strongly acid through slightly acid below a depth of 40 inches.

The Ap and A1 horizons have hue of 7.5YR or 10YR, value of 2 or 3, and chroma of 1 or 2.

The B horizon has hue of 5YR through 2.5Y, value of 4 through 6, and chroma of 1 through 4. These horizons have distinct or prominent mottles. Texture is silt loam, very fine sandy loam or loam. In places, there is a layer of fine sand or fine sandy loam that is up to 2 inches thick. Structure is weak medium subangular blocky, or this horizon is massive. Consistence is friable or very friable.

The C1 horizon, where present, has hue of 5YR to 2.5Y, value of 4 through 6, and chroma of 2 through 4. This horizon has distinct or prominent mottles. Texture is

silt loam, very fine sandy loam, or loam. Consistence is friable or very friable.

The IIC horizon has hue of 5YR through 2.5Y, value of 4 through 6, and chroma of 2 through 4. Texture is sand, gravelly sand, or stratified sand and gravel.

Ridgebury series

The Ridgebury series consists of coarse-loamy, mixed, mesic Aeric Fragiaquepts. These soils are poorly drained, nonstony to extremely stony and have a grayish brown, mottled, fine sandy loam B horizon over an olive, very firm gravelly sandy loam Cx horizon. They formed in loamy compact glacial till that derived mainly from gneiss and schist. The Ridgebury soils are in slightly concave areas and in depressions on drumlins and in shallow drainageways of glacial till uplands. Slope ranges from 0 to 5 percent.

Ridgebury soils are associated on the landscape with the well drained Paxton soils, the moderately well drained Woodbridge soils, and the very poorly drained Whitman soils. They are on the same landscape as the Leicester soils, which do not have a fragipan and have a more friable C horizon; the Hollis soils, which are somewhat excessively drained and have bedrock at a depth of 10 to 20 inches; and the Walpole soils, which have a C horizon consisting of sand or sand and gravel.

Typical pedon of Ridgebury fine sandy loam, in the town of Southbury, about 2,000 feet south of the New Haven-Litchfield county line and 300 feet west of Flag Swamp Road:

O—2 inches to 0; undecomposed grass over partly and well decomposed grass litter.

A1—0 to 6 inches; very dark brown (10YR 2/2) fine sandy loam; weak medium granular structure; friable; many fine roots; 10 percent coarse fragments; strongly acid; clear wavy boundary.

B21—6 to 10 inches; grayish brown (10YR 5/2) fine sandy loam; common medium distinct yellowish brown (10YR 5/8) mottles; weak medium subangular blocky structure; friable; many fine roots; 10 percent coarse fragments; strongly acid; clear wavy boundary.

B22—10 to 19 inches; grayish brown (2.5Y 5/2) fine sandy loam; many medium prominent yellowish brown (10YR 5/6) and dark brown (7.5YR 4/4) mottles; massive; friable; few fine roots; 10 percent coarse fragments; strongly acid; clear wavy boundary.

Cx—19 to 60 inches; olive (5Y 5/3) gravelly sandy loam; moderate thick platy structure; very firm; common very dark brown (10YR 2/2) oxide coating; strongly acid.

The thickness of the solum ranges from 15 to 30 inches and corresponds to the depth to the fragipan. Rock fragments, including stones and cobbles, range from 5 to 15 percent in the solum and 10 to 35 percent in the Cx horizon. Where this soil is not limed, reaction ranges from very strongly acid to medium acid throughout.

The Ap and A1 horizons have hue of 10YR, value of 2 or 3, and chroma of 1 or 2.

The B horizon has hue of 10YR or 2.5Y, value of 4 through 6, and chroma of 2 or less. This horizon has distinct or prominent mottles. Texture is dominantly fine sandy loam but includes loam and sandy loam. Structure is weak medium subangular blocky, or the horizon is massive. Consistence is friable or very friable.

The Cx horizon has hue of 2.5Y or 5Y, value of 4 through 6, and chroma of 2 through 4. This horizon has distinct or prominent mottles that are less abundant with depth. Texture is fine sandy loam, sandy loam, or the gravelly analogs. Structure is weak thick platy. Very dark gray (10YR 2/2) oxide coatings are common on the surface of peds. Consistence is firm or very firm with brittleness.

Rumney series

The Rumney series consists of coarse-loamy, mixed, acid, mesic Typic Fluvaquents. These soils are poorly drained soils and have a dark grayish brown and very dark gray mottled fine sandy loam and sandy loam B horizon over a black fine sandy loam buried A horizon over a dark brown sand C horizon. They formed in loamy alluvium that was derived mainly from gneiss, schist, and sandstone. In this survey area, the Rumney soils are a taxadjunct because they have noncontrasting texture. The Rumney soils are on flood plains along the major rivers and streams. Slope ranges from 0 to 3 percent.

Rumney soils are associated on the landscape with the moderately well drained Podunk soils. They are on the same landscape as the Saco soils, which are very poorly drained and formed in finer textured alluvium; the Scarboro soils, which are very poorly drained and formed in sandy outwash; and the well drained Agawam and Haven soils, which formed on adjacent outwash plains and terraces.

Typical pedon of Rumney fine sandy loam, in the town of Oxford, about 300 feet east of Connecticut Highway 67 and 500 feet north of the junction of Great Hill Road and Connecticut Highway 67:

Ap—0 to 6 inches; very dark grayish brown (10YR 3/2) fine sandy loam; weak medium granular structure; very friable; many fine roots; strongly acid; clear wavy boundary.

B21—6 to 10 inches; dark grayish brown (10YR 4/2) fine sandy loam; common medium distinct dark reddish brown (5YR 3/4) mottles; weak fine granular structure; very friable; common fine roots; strongly acid; clear wavy boundary.

B22—10 to 21 inches; very dark gray (10YR 3/1) sandy loam; common medium distinct yellowish red (5YR 4/6) mottles; weak medium granular structure; very friable; few fine roots; strongly acid; clear wavy boundary.

Ab—21 to 28 inches; black (10YR 2/1) fine sandy loam; few medium distinct brown (10YR 5/3) mottles; massive; very friable; strongly acid; clear wavy boundary.

C—28 to 60 inches; dark brown (10YR 3/3) sand with thin layers of gravel; single grain; loose; strongly acid.

The solum is 20 to 36 inches thick. Rock fragments range from 0 to 10 percent above a depth of 40 inches and from 0 to 25 percent below a depth of 40 inches. Reaction throughout these soils ranges from very strongly acid to medium acid.

The Ap and A1 horizons have hue of 10YR, value of 3 or 4, and chroma of 1 or 2.

The B horizon has hue of 10YR or 2.5Y, value of 3 through 5, and chroma of 1 or 2. Mottles are distinct or prominent. Texture is fine sandy loam or sandy loam. Structure is weak, fine, or medium granular. Consistence is friable or very friable.

The Ab horizon, where it occurs, has hue of 10YR, value of 2 or 3, and chroma of 1 or 2. This horizon is 0 to 8 inches thick. Structure is weak medium granular, or the horizon is massive. Consistence is friable or very friable.

The C horizon has hue of 10YR or 2.5Y, value of 3 through 5, and chroma of 1 through 3. Texture is loamy sand or sand with strata of gravel up to 4 inches thick.

Rumney Variant

The Rumney Variant soils consist of coarse loamy over sandy or sandy-skeletal, mixed, mesic Fluventic Umbric Dystrochrepts. These soils are poorly drained and have a reddish brown and dark reddish brown, mottled silt loam B horizon over a gray loamy sand and sand IIC horizon. They formed in loamy alluvium that was derived mainly from sandstone, conglomerate, arkose, and shale. These soils are on flood plains of the major rivers and streams. Slope ranges from 0 to 3 percent.

Rumney Variant soils are associated on the landscape with the moderately well drained Podunk Variant soils. They are on the same landscape as the well drained Branford soils and the moderately well drained Ellington soils, which formed in a loamy mantle over sand and gravel; and the excessively drained Manchester soils, which are on adjacent outwash terraces.

Typical pedon of Rumney Variant, silt loam, in the town of North Branford, about 1.3 miles south of Northford Center on the west side of Connecticut Route 22 and on the south side of a small local road just west of the Farm River:

O—2 inches to 0; decomposed and partly decomposed marsh grasses.

Ap—0 to 9 inches; dark brown (7.5YR 3/2) silt loam; moderate medium granular structure; friable; many fine roots; medium acid; clear wavy boundary.

B21—9 to 13 inches; reddish brown (5YR 4/3) silt loam; few fine faint yellowish red (5YR 4/6) mottles; weak medium subangular blocky structure; friable; many fine roots; medium acid; gradual wavy boundary.

B22—13 to 21 inches; reddish brown (5YR 4/3) silt loam; common medium distinct yellowish red (5YR 4/8) mottles; weak medium subangular blocky structure; friable; common fine roots; medium acid; gradual wavy boundary.

B23—21 to 31 inches; dark reddish brown (5YR 3/3) silt loam; common medium distinct yellowish red (5YR 4/6) mottles; weak medium subangular blocky structure; friable; few fine roots; medium acid; clear wavy boundary.

IIC1—31 to 43 inches; gray (5YR 5/1) loamy sand; massive; friable; medium acid; gradual wavy boundary.

IIC2—43 to 60 inches; gray (5YR 5/1) fine sand; loose; single grain; medium acid.

The thickness of the solum ranges from 20 to 40 inches, and it corresponds to the depth to sand or sand and gravel. Rock fragments range from 0 to 3 percent in the solum and from 0 to 25 percent in the IIC horizon. Reaction ranges from strongly acid to slightly acid in the IIC horizon.

The Ap and A1 horizons have hue of 5YR through 10YR and value and chroma of 2 or 3.

The B horizon has hue of 2.5YR or 5YR, value of 3 through 6, and chroma of 2 through 4. This horizon has distinct or prominent mottles. Texture is silt loam or very fine sandy loam. Structure is weak medium subangular blocky, or the horizon is massive. Consistence is friable or very friable.

The IIC horizon has hue of 5YR through 10YR, value of 4 through 6, and chroma of 1 through 4. Texture is loamy sand, sand, or stratified sand and gravel.

Saco series

The Saco series consists of coarse-silty, mixed, nonacid, mesic Fluvaquentic Humaquepts. These soils are very poorly drained and have a dark gray and very dark gray mottled silt loam and very fine sandy loam Cg horizon over a very dark gray IICg horizon. They formed in alluvium that was derived mainly from gneiss and schist. These soils are a taxadjunct because the A horizon is thinner than defined for the Saco series. They are on low flood plains adjacent to the major rivers and streams. Slopes range from 0 to 2 percent.

Saco soils are associated on the landscape with the well drained Agawam and Haven soils; the poorly drained Walpole, Raypol, and Raynham soils; and the

poorly drained Rumney soils, which formed in coarser textured alluvium.

Typical pedon of Saco silt loam, in the town of Oxford, 200 feet southeast of the junction of the high voltage electric lines and Connecticut Highway 67 near Christian Street:

A1—0 to 8 inches; very dark gray (10YR 3/1) silt loam; weak medium granular structure; very friable; many roots; medium acid; clear wavy boundary.

C1g—8 to 13 inches; dark gray (N 4/) silt loam; common medium distinct yellowish red (5YR 4/6) mottles; weak medium granular structure; very friable; common roots; medium acid; clear wavy boundary.

C2g—13 to 22 inches; dark gray (N 4/) very fine sandy loam; few medium distinct yellowish red (5YR 4/6) mottles; massive; very friable; few roots; slightly acid; clear wavy boundary.

C3g—22 to 41 inches; very dark gray (10YR 3/1) silt loam; massive; very friable; slightly acid; clear wavy boundary.

IIC4g—41 to 60 inches; very dark gray (10YR 3/1) stratified sand and gravel; single grain; loose; slightly acid.

The depth to sand and gravel ranges from 40 to 50 inches. Coarse fragments make up less than 2 percent of the volume. Reaction is strongly acid to slightly acid in the upper part and medium acid to neutral in the lower part.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2.

The C horizon has hue of 10YR through 5Y or is neutral, value of 3 through 5, and chroma of 0 or 1. This horizon is silt loam or very fine sandy loam. In places, there are layers of loamy very fine sand, loamy fine sand, or muck up to 2 inches thick. Structure is weak medium granular, or the horizon is massive. Consistence is friable or very friable.

Scarboro series

The Scarboro series consists of sandy, mixed, mesic Histic Humaquepts. These soils are very poorly drained. They have a layer of black muck over a very dark gray loamy sand A horizon and a gray and grayish brown mottled sand C horizon. They formed in glacial outwash that was derived mainly from gneiss and schist. The Scarboro soils are in low depressions on outwash plains and terraces. The slope ranges from 0 to 3 percent.

Scarboro soils are associated on the landscape with the moderately well drained Deerfield soils. They are on the same landscape as the Walpole soils, which are very poorly drained; the Penwood soils, which are excessively drained; the Ninigret soils, which are moderately well drained and have a finer textured solum; and the Adrian soils, which are poorly drained and have a thicker organic horizon.

Typical pedon of Scarboro muck, in the town of Wolcott, about 150 feet south of Long Swamp Road and 100 feet west of Roaring Brook:

O1—12 inches to 0; black (10YR 2/1) muck; weak medium granular structure; very friable; many fine roots; strongly acid; clear wavy boundary.

A1—0 to 5 inches; very dark gray (10YR 3/1) loamy sand; weak medium granular structure; very friable; few roots; strongly acid; clear wavy boundary.

C1—5 to 19 inches; gray (N 6/) fine sand; single grain; loose; strongly acid; gradual wavy boundary.

C2—19 to 60 inches; grayish brown (2.5Y 5/2) sand; few medium distinct yellowish brown (10YR 5/6) mottles; single grain; loose; 5 percent coarse fragments; medium acid.

Rock fragments range from 0 to 10 percent to a depth of 40 inches and from 0 to 50 percent below 40 inches. Reaction ranges from very strongly acid to medium acid.

The Ap and A1 horizons have hue of 10YR, value of 2 or 3, and chroma of 1 or 2. The C1 horizon has hue of 10YR through 5Y, value of 5 through 7, and chroma of 0 or 1. In places there are a few faint mottles. The C2 horizon has hue of 10YR through 5Y, value of 4 through 6, and chroma of 1 or 2. Mottles are faint, distinct, or prominent. Texture of the C horizon is loamy sand, fine sand, sand, or the gravelly analogs.

Scio series

The Scio series consists of coarse-silty, mixed, mesic Aquic Dystrochrepts. These soils are moderately well drained. They have a dark brown silt loam B horizon over a brown very fine sandy loam and loamy very fine sand C horizon. They formed in wind- or water-deposited silt loam or very fine sandy loam derived mainly from gneiss, schist, and sandstone. The Scio soils are on small terraces and outwash plains. Slope ranges from 0 to 3 percent.

Scio soils are associated on the landscape with the poorly drained Raynham soils. They are on the same landscape as the Ellington soils, which are underlain by sand or sand and gravel within a depth of 40 inches, the Branford soils, which are well drained, and the Raypol soils, which are poorly drained.

Typical pedon of Scio silt loam, in the town of Cheshire, on the south side of Schoolhouse Road just east of the railroad tracks:

Ap—0 to 8 inches; dark brown (10YR 4/3) silt loam; moderate medium granular structure; friable; few fine roots; medium acid; abrupt smooth boundary.

B21—8 to 14 inches; dark brown (7.5YR 4/4) silt loam; weak medium subangular blocky structure; friable; few fine roots; strongly acid; gradual wavy boundary.

B22—14 to 22 inches; dark brown (7.5YR 4/4) silt loam; common medium distinct dark reddish brown (5YR 3/4) and strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; friable; strongly acid; gradual wavy boundary.
C1—22 to 42 inches; brown (7.5YR 4/4) very fine sandy loam; common medium distinct dark reddish brown (5YR 3/4), strong brown (7.5YR 5/6), and pinkish gray (7.5YR 6/2) mottles; massive; friable; strongly acid; gradual wavy boundary.
C2—42 to 60 inches; brown (7.5YR 4/4) loamy very fine sand; common medium distinct strong brown (7.5YR 5/6) and pinkish gray (7.5YR 6/2) mottles; massive; friable; strongly acid.

The solum is 20 to 36 inches thick. Rock fragments range from 0 to 5 percent. Reaction ranges from very strongly acid to medium acid in the solum and strongly acid to slightly acid in the C horizon.

The Ap and A1 horizons have hue of 10YR, value of 2 through 4, and chroma of 2 or 3.

The B2 horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 through 6. Texture is silt loam or very fine sandy loam. Structure is weak medium subangular blocky or weak thick platy. Consistence is friable or very friable.

The C horizon ranges in hue from 7.5YR through 2.5Y and has value of 4 or 5 and chroma of 2 through 4. Texture is silt loam or very fine sandy loam. At a depth below 40 inches the C horizon ranges to stratified sand and gravel.

Sutton series

The Sutton series consists of coarse-loamy, mixed, mesic Aquic Dystrochrepts. These soils are moderately well drained and nonstony to extremely stony. They have a dark brown and yellowish brown fine sandy loam B horizon mottled in the lower part over a brown and light olive brown fine sandy loam and gravelly sandy loam C horizon. They formed in loamy glacial till that derived mainly from gneiss and schist. The Sutton soils are on concave slopes and in slight depressions on glacial uplands. Slopes range from 0 to 15 percent but are dominantly 0 to 8 percent.

Sutton soils are associated on the landscape with the well drained Charlton soils and the poorly drained Leicester soils. They are on the same landscape as the Paxton soils, which are well drained and have a fragipan at about 26 inches; the Woodbridge soils, which are moderately well drained and have a fragipan at about 25 inches; and the Hollis soils which are well drained and have bedrock at a depth of 10 to 20 inches.

Typical pedon of Sutton extremely stony fine sandy loam, 3 to 15 percent slopes in a woodlot in the town of Prospect, 400 feet east of Summit Road and 70 feet north of Merriman Road:

O1—2 inches to 1 inch; undecomposed organic litter.
O2—1 inch to 0; decomposed and partly decomposed organic litter.
A1—0 to 6 inches; very dark grayish brown (10YR 3/2) fine sandy loam; weak medium granular structure; very friable; common fine and medium roots; 5 percent coarse fragments; strongly acid; clear wavy boundary.
B21—6 to 12 inches; dark brown (7.5YR 4/4) fine sandy loam; very weak subangular blocky structure; friable; common fine and medium roots; 10 percent coarse fragments; medium acid; gradual wavy boundary.
B22—12 to 24 inches; yellowish brown (10YR 5/6) fine sandy loam; common fine and medium distinct light brownish gray (2.5Y 6/2) and yellowish red (5YR 5/6) mottles; very weak subangular blocky structure; friable; few medium roots; 10 percent coarse fragments; medium acid; gradual wavy boundary.
B23—24 to 28 inches; yellowish brown (10YR 5/4) fine sandy loam; common medium distinct light brownish gray (2.5Y 6/2), reddish brown (5YR 4/4), and strong brown (7.5YR 5/6) mottles; very weak subangular blocky structure; friable; 10 percent coarse fragments; medium acid; gradual wavy boundary.
C1—28 to 36 inches; brown (10YR 5/3) fine sandy loam; common medium distinct light brownish gray (2.5Y 6/2) and strong brown (7.5YR 5/6) mottles in the upper part; weak thick platy structure; firm in place; 15 percent coarse fragments; medium acid; gradual wavy boundary.
C2—36 to 60 inches; light olive brown (2.5Y 5/4) gravelly sandy loam; massive; friable; 25 percent coarse fragments; medium acid.

The solum is 20 to 36 inches thick. Rock fragments, including stones and cobbles, range from 5 to 15 percent in the solum and from 5 to 35 percent in the C horizon. Reaction ranges from very strongly acid to medium acid in the solum and from strongly acid to slightly acid in the C horizon.

The Ap and A1 horizons have hue of 10YR, value of 2 through 4, and chroma of 2 or 3.

The B21 horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 through 6. The B22 and B23 horizons have hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 4 through 6. Above a depth of 24 inches, the B horizon has mottles that have chroma of 2 or less. Texture is fine sandy loam or sandy loam. Structure is weak medium subangular blocky, or the horizons are massive. Consistence is friable or very friable.

The C horizon has hue of 10YR through 5Y, value of 4 through 6, and chroma of 2 through 4. Texture is fine sandy loam, sandy loam, or the gravelly analogs. This horizon is massive, or it has weak thick platy structure. Consistence is friable; there are firm lenses up to 4 inches thick in many places.

Walpole series

The Walpole series consists of sandy, mixed, mesic Aeric Haplaquepts. These soils are poorly drained and have a B horizon of grayish brown and light brownish gray mottled sandy loam over a IIC horizon of light olive brown mottled stratified sand and gravel. They formed in glacial outwash that was derived mainly from gneiss and schist. The Walpole soils are in depressions and along small drainageways on outwash plains and terraces of the stream valleys. Slope ranges from 0 to 3 percent.

Walpole soils are associated on the landscape with the excessively drained Hinckley soils. They are on the same landscape as the Ninigret soils, which are moderately well drained and have a finer textured solum; the Agawam and Haven soils, which are well drained and have a finer textured solum; the Raypol soils, which have a finer textured solum; and the Scarboro soils, which are very poorly drained.

Typical pedon of Walpole sandy loam, in the town of Prospect, 500 feet west of Roaring Brook Road and 0.7 miles south of Cook Road:

O—2 inches to 0; undecomposed deciduous leaves and twigs over partly decomposed and decomposed litter.

A1—0 to 5 inches; very dark brown (10YR 2/2) sandy loam; weak medium granular structure; friable; common fine and medium roots; 5 percent coarse fragments; very strongly acid; clear wavy boundary.

B21—5 to 14 inches; grayish brown (2.5Y 5/2) sandy loam; weak medium subangular blocky structure; friable; few fine roots; few earthworm casts; 10 percent coarse fragments; strongly acid; gradual wavy boundary.

B22—14 to 24 inches, light brownish gray (2.5Y 6/2) sandy loam; common medium distinct yellowish brown (10YR 5/6) mottles; massive; friable; 10 percent coarse fragments; strongly acid; clear wavy boundary.

IIC—24 to 60 inches, light olive brown (2.5Y 5/4) stratified sand and gravel; few fine faint yellowish brown (10YR 5/6) mottles; single grain; loose; 25 percent coarse fragments; strongly acid.

The thickness of the solum ranges from 18 to 28 inches and corresponds to the depth to sand and gravel. Rock fragments range from 0 to 25 percent in the solum and from 0 to 50 percent in the IIC horizon. Reaction ranges from very strongly acid to medium acid, if the soils have not been limed.

The Ap and A1 horizons have hue of 10YR, value of 2 or 3, and chroma of 1 or 2.

The B horizon has hue of 10YR or 2.5Y, value of 4 through 6, and chroma of 2 or 3. Mottles are distinct or prominent. Texture is fine sandy loam or sandy loam. Structure is weak medium subangular blocky, or the horizon is massive. Consistence is friable or very friable.

The IIC horizon has hue of 10YR or 2.5Y, value of 4 through 6, and chroma of 2 through 4. Texture is sand or stratified sand and gravel.

Watchaug series

The Watchaug series consists of coarse-loamy, mixed, mesic, Aquic Dystrochrepts. These soils are moderately well drained nonstony to extremely stony. They have a reddish brown and yellowish red fine sandy loam mottled B horizon over a reddish brown mottled gravelly sandy loam C horizon. They formed in loamy glacial till that was derived mainly from sandstone, conglomerate, arkose, and shale. The Watchaug soils are on concave slopes and in slight depressions on glacial uplands. Slopes range from 0 to 15 percent but are dominantly 0 to 8 percent.

Watchaug soils are associated on the landscape with the well drained Cheshire soils. They are on the same landscape as the Wethersfield soils, which are well drained and have a fragipan at a depth of about 25 inches; the Ludlow soils, which have a fragipan at a depth of about 30 inches; the Yalesville soils, which are well drained and have bedrock at a depth of 20 to 40 inches; and the Holyoke soils, which have bedrock at a depth of 10 to 20 inches.

Typical pedon of Watchaug fine sandy loam, 3 to 8 percent slopes, in the town of Wallingford, 250 feet north of the intersection of Cook Hill Road and Schoolhouse Road:

Ap—0 to 8 inches; dark reddish brown (5YR 3/3) fine sandy loam; weak medium and fine granular structure; friable; common fine and medium roots; 8 percent coarse fragments; strongly acid; clear wavy boundary.

B21—8 to 18 inches; reddish brown (5YR 4/4) fine sandy loam; weak medium subangular blocky structure; friable; common fine and medium roots; 10 percent coarse fragments; strongly acid; gradual wavy boundary.

B22—18 to 24 inches; yellowish red (5YR 5/6) fine sandy loam; common medium distinct strong brown (7.5YR 5/6) and pinkish gray (5YR 6/2) mottles; very weak medium subangular blocky structure; very friable; few fine and medium roots; 10 percent coarse fragments; strongly acid; gradual wavy boundary.

C—24 to 60 inches; reddish brown (5YR 4/3) gravelly sandy loam; common medium distinct pale red (2.5YR 6/2) and reddish brown (2.5YR 5/4) mottles; massive; friable; few fine roots above 48 inches; 25 percent coarse fragments; strongly acid.

The solum is 20 to 34 inches thick. Rock fragments, including stones and cobbles, range from 5 to 20 per-

cent in the solum and from 10 to 35 percent in the C horizon. Reaction ranges from very strongly acid to medium acid in the solum and from very strongly acid to slightly acid in the substratum.

The Ap and A1 horizons range in hue from 5YR through 10YR and have value of 2 though 4 and chroma of 1 through 3.

The B2 horizon has hue of 2.5YR or 5YR, value of 3 through 5, and chroma of 3 through 6. This horizon has mottles that have chroma of 2 or less above 24 inches. Texture is fine sandy loam or silt loam. Structure is weak medium subangular blocky, or the horizon is massive. Consistence is friable or very friable.

The C horizon has hue of 2.5YR or 5YR, value of 4 through 6, and chroma of 3 or 4. This horizon has distinct or prominent mottles. Texture is fine sandy loam, sandy loam, or the gravelly analogs. This horizon is massive, or it has weak thick platy structure. Consistence is friable. There are firm lenses up to 4 inches thick in many places.

Westbrook series

The Westbrook series consists of euic, mesic Typic Sulfihemists. These soils are very poorly drained. They consist of mucky peat, which is high in salts, over dark gray silt loam. These soils are subject to tidal flooding twice daily. They formed in partly decomposed organic material from salt-tolerant herbaceous plants over loamy sediments that were derived mainly from gneiss and schist. Slope ranges from 0 to 2 percent and is dominantly less than 1 percent.

Westbrook soils are adjacent to the excessively drained Hinckley and Manchester soils, the well drained Agawam, Branford, and Charlton soils, and the somewhat excessively drained Hollis soils.

Typical pedon of Westbrook mucky peat, in the town of Guilford, about 4,000 feet south of Guilford Station near the mouth of the East River:

Oe1—0 to 8 inches; very dark brown (10YR 2/2) mucky peat; 75 percent fiber, 35 percent rubbed; dense mat of roots, stems, and leaves; massive; slightly sticky; many roots; sodium pyrophosphate extract color light gray (10YR 7/1); 62 percent organic matter; total salts, 26,000 parts per million; slightly acid; clear wavy boundary.

Oe2—8 to 36 inches; very dark grayish brown (10YR 3/2) mucky peat; 75 percent fiber, 30 percent rubbed; massive; slightly sticky; few roots; thin lenses of silt; sodium pyrophosphate extract color light gray (10YR 7/1); 48 percent organic matter; total salts, 27,300 parts per million; neutral; gradual wavy boundary.

Oe3—36 to 48 inches; very dark gray (5Y 3/1) mucky peat; 60 percent fiber, 30 percent rubbed; massive; slightly sticky; sodium pyrophosphate extract color light gray (10YR 7/1); 21 percent organic matter; total salts, 31,200 parts per million; neutral; gradual wavy boundary.

IIC—48 to 99 inches; dark gray (5Y 4/1) silt loam; massive; slightly sticky; 8 percent organic matter; total salts, 25,000 parts per million; slightly acid.

The organic layers range from 16 to 51 inches in thickness. These soils range from strongly acid to neutral in their natural condition. Total salt content ranges from 1,000 to 35,000 parts per million. Many pedons have thin layers of silt in the organic layers.

The surface tier ranges in hue from 10YR through 5Y and has value of 2 through 4 and chroma of 0 through 2. The organic matter content ranges from 20 to 70 percent.

The subsurface and bottom tiers range in hue from 10YR through 5Y and have value of 2 through 5 and chroma of 0 through 3. The organic matter content ranges from 20 to 70 percent. Layers of fibric or sapric materials up to 6 inches thick are common in places.

The IIC horizon ranges in hue from 10YR through 5Y and has value of 2 through 5 and chroma of 0 through 2. Texture is silt loam, silt, or very fine sandy loam. Shell fragments and herbaceous fibers range from 0 to 5 percent.

Wethersfield series

The Wethersfield series consists of coarse-loamy, mixed, mesic Typic Fragiochrepts. These soils are well drained, nonstony to extremely stony and have a reddish brown loam B horizon over a reddish brown fine sandy loam Cx horizon. They formed in compact glacial till that was derived mainly from reddish colored sandstone, conglomerate, arkose, shale, and some basalt. Wethersfield soils are on drumlins and on the higher parts of the larger hills. Slopes range from 3 to 35 percent but are dominantly 3 to 15 percent.

Wethersfield soils are associated on the landscape with the moderately well drained Ludlow soils, the poorly drained Wilbraham soils, and the very poorly drained Menlo soils. They are on the same landscape as the Cheshire soils, which have a more friable Cx horizon.

Typical pedon of Wethersfield loam, 3 to 8 percent slopes, in the town of Branford, 1 mile east of Leetes Island Road on the south side of Red Hill Road:

O1—2 inches to 1 inch; undecomposed litter of deciduous leaves and twigs.

O2—1 inch to 0; very dark brown (10YR 2/2) decomposed organic matter with decomposed deciduous leaves and twigs.

A1—0 to 3 inches; very dark brown (10YR 2/2) loam; moderate medium granular structure; friable; common fine and medium roots; 8 percent coarse fragments; strongly acid; clear wavy boundary.

B21—3 to 13 inches; reddish brown (5YR 5/4) loam; weak medium subangular blocky structure; friable; common fine and medium roots; 10 percent coarse fragments; strongly acid; gradual wavy boundary.

B22—13 to 25 inches; reddish brown (5YR 4/4) loam; weak medium subangular blocky structure; friable; common medium and fine roots; 10 percent coarse fragments; medium acid; clear wavy boundary.

Cx—25 to 60 inches; reddish brown (2.5YR 4/4) fine sandy loam; weak thick platy structure; very firm, brittle; few very dark brown (10YR 2/2) oxide coatings; 15 percent coarse fragments; medium acid.

The solum is 20 to 36 inches thick. Rock fragments, including stones and cobbles, range from 5 to 20 percent in the solum and from 10 to 35 percent in the Cx horizon. Reaction is very strongly acid or strongly acid above the fragipan and very strongly acid to medium acid in the fragipan.

The Ap and A1 horizons have hue of 5YR to 10YR, value of 2 through 4, and chroma of 2 or 3.

The B horizon has hue of 2.5YR or 5YR, value of 3 through 5, and chroma of 3 or 4. Texture is loam, silt loam, or fine sandy loam. Structure is weak medium subangular blocky. Consistence is friable or very friable.

The Cx horizon has hue of 2.5YR or 5YR, value of 3 through 5, and chroma of 3 or 4. Texture is loam, silt loam, fine sandy loam, or the gravelly analogs. This horizon has weak thick platy structure. Consistence is very firm or firm and brittle. Manganese coatings are common.

Whitman series

The Whitman series consists of coarse-loamy, mixed, mesic Typic Fragiaquepts. These soils are very poorly drained and extremely stony. They have a B horizon of gray mottled fine sandy loam over an olive mottled, gravelly sandy loam, compact Cx horizon. They formed in compact loamy glacial till that derived mainly from gneiss and schist. The Whitman soils are in drainageways, at the base of hills and ridges, and in depressions of glacial uplands. Slope ranges from 0 to 5 percent.

Whitman soils are associated on the landscape with the well drained Paxton soils, the moderately well drained Woodbridge soils, and the poorly drained Ridgebury soils. They are on the same landscape as the Charlton soils, which are well drained; the Sutton soils, which are moderately well drained; and the Leicester soils, which are poorly drained—all of these soils have a more friable C horizon; and the Hollis soils which are somewhat excessively drained and have bedrock at a depth of 10 to 20 inches.

Typical pedon of Whitman extremely stony fine sandy loam, in an area of Ridgebury, Leicester, and Whitman extremely stony fine sandy loams, in the town of Bethany, about 0.4 mile south of Connecticut Route 42 on the west side of Connecticut Route 69:

O—4 inches to 0; undecomposed hardwood leaves and twigs over partly decomposed and decomposed litter.

A1—0 to 6 inches; black (10YR 2/1) fine sandy loam; moderate fine granular structure; very friable; many roots; 10 percent coarse fragments; medium acid; abrupt wavy boundary.

B2g—6 to 22 inches; gray (10YR 6/1) fine sandy loam; few fine distinct yellowish brown (10YR 5/6) and pale brown (10YR 6/3) mottles; weak medium subangular blocky structure; friable; few roots; 15 percent coarse fragments; medium acid; gradual wavy boundary.

C1x—22 to 36 inches; olive (5Y 5/3) gravelly sandy loam; common medium distinct yellowish brown (10YR 5/4) mottles; weak thick platy structure; very firm; 25 percent coarse fragments; very dark brown (10YR 2/2) oxide coatings; medium acid.

C2x—36 to 60 inches; olive (5Y 5/3) gravelly sandy loam; few medium distinct yellowish brown (10YR 5/6) mottles; weak thick platy structure; very firm; 25 percent coarse fragments; very dark brown (10YR 2/2) oxide coatings; medium acid.

The solum is 15 to 25 inches thick. Rock fragments, including stones and cobbles, range from 5 to 20 percent in the solum and from 10 to 35 percent in the Cx horizon. Reaction throughout these soils ranges from very strongly acid to slightly acid.

The Ap and A1 horizons have hue of 10YR, value of 2, and chroma of 1 or 2.

The B horizon has hue of 10YR or 2.5Y, value of 4 through 6, and chroma of 1 or 2. It has few mottles. Texture is fine sandy loam, loam, or sandy loam. Structure is weak medium subangular blocky, or the horizon is massive. Consistence is friable or very friable.

The Cx horizon has hue of 2.5Y or 5Y, value of 4 through 6, and chroma of 2 or 3. Texture is fine sandy loam, sandy loam, or the gravelly analogs. This horizon has weak thick platy structure, or it is massive. Consistence is firm or very firm and brittle.

Wilbraham series

The Wilbraham series consists of coarse-loamy, mixed, mesic Aquic Fragiochrepts. These are poorly drained nonstony to extremely stony soils that have a reddish brown mottled silt loam B horizon over a reddish brown, mottled, very firm loam Cx horizon. The soils formed in loamy glacial till that was derived mainly from sandstone, conglomerate, arkose, and shale. The Wilbraham soils are on concave slopes, in slight depressions, and along small drainageways on glacial uplands. Slope ranges from 0 to 5 percent.

Wilbraham soils are associated on the landscape with the well drained Wethersfield soils, the moderately well drained Ludlow soils, and the very poorly drained Menlo soils. They are on the same landscape as the Cheshire soils, which are well drained and have a more friable C horizon; the Watchaug soils, which are moderately well drained and have a more friable C horizon; the Yalesville soils, which are well drained and have bedrock at a depth of 20 to 40 inches; and the Holyoke soils, which are somewhat excessively drained and have bedrock at a depth of 10 to 20 inches.

Typical pedon of Wilbraham silt loam, in the town of Wallingford, 500 feet east of North Branford Road and 1,000 feet south of Whirlwind Hill Road:

Ap—0 to 8 inches; dark brown (10YR 3/3) silt loam; weak medium granular structure; friable; many fine roots; 5 percent coarse fragments; medium acid; clear smooth boundary.

B21—8 to 19 inches; reddish brown (5YR 4/3) silt loam; common fine distinct pinkish gray (7.5YR 6/2) and strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; friable; few fine roots; 10 percent coarse fragments; strongly acid; gradual wavy boundary.

B22—19 to 25 inches; reddish brown (5YR 4/4) silt loam; common medium distinct pinkish gray (7.5YR 6/2) and strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; friable; few fine roots; 10 percent coarse fragments; strongly acid; clear wavy boundary.

Cx—25 to 60 inches; reddish brown (5YR 4/4) loam; common fine distinct pinkish gray (7.5YR 6/2) and yellowish red (5YR 4/6) mottles; weak thick platy structure; very firm; very dark grayish brown (10YR 3/2) oxide coatings; 15 percent coarse fragments; strongly acid.

The solum ranges in thickness from 16 to 32 inches. Rock fragments range from 5 to 15 percent in the solum and from 10 to 35 percent in the Cx horizon. Reaction ranges from very strongly acid to strongly acid in the solum and from very strongly acid to medium acid in the Cx horizon.

The Ap and A1 horizons have hue of 7.5YR or 10YR, value of 2 through 4, and chroma of 1 through 3.

The B2 horizon has hue of 2.5YR or 5YR, value of 3 through 5, and chroma of 3 or 4. Mottles are distinct or prominent. Texture is loam or silt loam. Structure is weak, medium, or coarse subangular blocky. Consistence is friable or very friable.

The Cx horizon has hue of 2.5YR or 5YR, value of 3 through 5, and chroma of 3 or 4. Mottles are distinct or prominent; they are less abundant with depth. Texture is loam, silt loam, fine sandy loam, or the gravelly analogs. Structure is weak thick platy, or the horizon is massive. Consistence is firm or very firm and brittle.

Woodbridge series

The Woodbridge series consists of coarse-loamy, mixed, mesic Typic Fragiochrepts. These are moderately well drained, nonstony to extremely stony soils that have a dark yellowish brown and olive brown mottled fine sandy loam B horizon over an olive, mottled, very firm gravelly fine sandy loam Cx horizon. The soils formed in compact glacial till that was derived mainly from gneiss and schist. The Woodbridge soils are in concave and slightly depressional areas on the top and near the foot slopes of drumlins and ridges. Slopes range from 0 to 15 percent but are dominantly 0 to 8 percent.

Woodbridge soils are associated on the landscape with the well drained Paxton soils, the poorly drained Ridgebury soils, and the very poorly drained Whitman soils. They are on the same landscape as the Sutton soils which have a more friable C horizon, the Charlton soils which are well drained and have a more friable C horizon, and the Hollis soils which are somewhat excessively drained and have bedrock at a depth of 10 to 20 inches.

Woodbridge very stony fine sandy loam, 3 to 8 percent slopes, in the town of Prospect, about 0.3 mile east of Straitsville Road and 1.5 miles north of the Bethany town line:

Ap—0 to 7 inches; dark brown (10YR 3/3) fine sandy loam; weak medium granular structure; friable; many fine roots; 5 percent coarse fragments; medium acid; abrupt wavy boundary.

B21—7 to 18 inches; dark yellowish brown (10YR 4/4) fine sandy loam; weak medium subangular blocky structure; friable; few fine roots; 8 percent coarse fragments; strongly acid; gradual wavy boundary.

B22—18 to 25 inches; olive brown (2.5Y 4/4) fine sandy loam; common medium distinct strong brown (7.5YR 5/8) and grayish brown (10YR 5/2) mottles; weak medium subangular blocky structure; friable; 10 percent coarse fragments; strongly acid; clear wavy boundary.

Cx—25 to 60 inches; olive (5Y 5/3) gravelly fine sandy loam; common medium distinct yellowish brown (10YR 5/6) mottles; weak thick platy structure; very firm, brittle; many black oxide coatings; 25 percent coarse fragments; strongly acid.

The thickness of the solum corresponds to the depth of the fragipan and ranges from 20 to 36 inches. Rock fragments, including stones and cobbles, range from 5 to 20 percent in the solum and from 10 to 35 percent in the Cx horizon. Reaction throughout these soils is strongly acid or medium acid.

The Ap and A1 horizons have hue of 10YR, value of 3 or 4, and chroma of 2 or 3.

The B21 horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 through 6. The B22 horizon has

hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 4 through 6. The B horizon has distinct or prominent mottles below a depth of 12 inches. Texture of the B horizon is dominantly fine sandy loam, but in places it ranges to sandy loam and loam. Structure is weak medium subangular blocky or weak medium granular. Consistence is friable or very friable.

The Cx horizon has hue of 2.5Y or 5Y, value of 4 or 5, and chroma of 2 through 4. This horizon is mottled at least in the upper part. Texture is fine sandy loam or sandy loam or the gravelly analogs. Structure is weak, thick or medium platy. Consistence is firm or very firm and brittle. Oxide coatings are common on the ped surface.

Yalesville series

The Yalesville series consists of coarse-loamy, mixed, mesic Typic Dystrochrepts. These are well drained soils that have a reddish brown fine sandy loam and loam B horizon and a reddish brown sandy loam C horizon over reddish brown sandstone bedrock. The soils formed in a thin mantle of glacial till that was derived mainly from Triassic sandstone, conglomerate, shale, and some basalt and arkose. Yalesville soils are on low hills of bedrock-controlled till plains. Slope ranges from 3 to 15 percent.

Yalesville soils are on the same landscape as the Wethersfield soils, which have a fragipan at a depth of about 25 inches; the Cheshire soils, which are deeper than the Yalesville soils; and the Holyoke soils, which have bedrock at a depth of 10 to 20 inches.

Typical pedon of Yalesville fine sandy loam, 3 to 8 percent slopes, in the town of North Branford, 2,000 feet north of the junction of Village Street and Clintonville Road and 250 feet west of Village Street in an open field:

Ap—0 to 8 inches; dark brown (7.5YR 3/2) fine sandy loam; weak medium granular structure; friable; common fine and medium roots; 5 percent coarse fragments; medium acid; abrupt smooth boundary.

B21—8 to 14 inches; reddish brown (5YR 4/4) fine sandy loam; weak medium subangular blocky structure; friable; common fine and medium roots; 5 percent coarse fragments; few very dark grayish brown (10YR 3/2) earthworm casts; medium acid; gradual wavy boundary.

B22—14 to 25 inches; reddish brown (5YR 4/4) loam; weak medium subangular blocky structure; friable; few fine roots; 5 percent coarse fragments; medium acid; gradual wavy boundary.

C—25 to 36 inches; reddish brown (2.5YR 4/4) sandy loam; massive; firm; 15 percent fragments of sandstone; medium acid; clear wavy boundary.

R—36 inches, reddish brown (2.5YR 4/4) hard sandstone bedrock.

The solum ranges in thickness from 18 to 34 inches. The depth to bedrock ranges from 20 to 40 inches. Rock fragments range from 2 to 10 percent in the solum and from 0 to 50 percent in the C horizon. Reaction throughout these soils ranges from very strongly acid to medium acid.

The Ap and A1 horizons range in hue from 5YR to 10YR and have value and chroma of 2 or 3.

The B horizon has hue of 2.5YR or 5YR, value of 3 or 4, and chroma of 4 through 6. Texture is silt loam, loam, or fine sandy loam. Structure is weak subangular blocky, or the horizon is massive. Consistence is friable or very friable.

Where there is a C horizon, it has hue of 2.5YR or 5YR, value of 4 or 5, and chroma of 4 through 6. Texture is sandy loam or loam. Consistence is friable, or the horizon is firm partly weathered sandstone.

Formation of the soils

David E. Hill, associate soil scientist, Connecticut Agricultural Experiment Station, helped prepare this section.

Soils are produced by various physical and chemical processes acting on geologic material. Some processes cause seasonal changes; others react slowly over hundreds, even thousands, of years. The magnitude of change is influenced by five factors of soil formation—parent material, climate, living organisms, relief, and time (*7*). These factors do not act independently, but each modifies the effects of the other four. Climate and living organisms are the active agents that modify the parent material desposited by geologic events. In New Haven County, these active forces have been influencing soil formation since the last glacial event which took place 10,000 years ago or more.

Soil formation, which has produced soils of varying morphological characteristics, is the sum of many physical and chemical processes. Glacial ice pulverized local bedrock and transported it to new locations. As the ice melted, water transported and segregated particles of sediment even farther from their sources and deposited them on a newly formed landscape. Strong polar winds redistributed fine soil particles before vegetation became established. As the climate warmed and vegetation became established, the chemical processes of weathering began to exert an increasing influence on soil formation.

The differences among the soils in New Haven County are primarily attributed to differences in parent material, relief, and time. The influence of climate and living organisms has been relatively uniform throughout the county and does not account for important differences among the soils. The kinds of rocks pulverized by glaciers have provided the parent materials from which the soils have formed. The relief has influenced soil formation by affecting drainage. Soils that have formed in

recent alluvial sediment have had less time for the soil forming processes to operate.

In the following pages, each of the soil forming factors are discussed as they apply to the distribution and morphology of the soils in New Haven County.

Climate

New Haven County has a climate that is modified by its proximity to Long Island Sound and the Atlantic Ocean. Winters are cold and summers are warm. The average annual precipitation of 47 inches is fairly evenly distributed throughout the year. Detailed information on climate is given in the section "General nature of the county."

The elements of climate that most affect soil formation are temperature and precipitation. They act directly on the parent material and indirectly on the biological populations, which also modify rock and minerals. The amount of water percolating through a soil alters the chemical composition of the soil over a long period of time. The leaching of soluble chemical constituents produced by the weathering of the parent material depends on the amount of rainfall that infiltrates the soil and on the steepness of the slopes.

Rainfall also causes soils to erode, especially soils on steep slopes and those unprotected by crops or vegetation. On the steeper slopes in cultivated areas, the soils tend to be thinner and the profiles more weakly developed. Erosion resulting from man's activities modifies the natural horizons of the soils and sometimes obliterates them completely.

Temperature influences the native vegetation that covers the hillsides, the microflora and fauna in the weathering zone, and the rate of the chemical weathering processes. If the mean annual temperature in the county is 50 degrees F, biological activity is high, this results in a fairly rapid rate of destruction and mineralization of organic matter if soils are well aerated. In poorly drained areas, biological activity is low and organic matter accumulates more rapidly.

The action of frost affects the structural properties of the soil and causes increased aggregation of soil particles within the frost zone. Aggregation increases the percolation rate and the leaching potential of the soil.

Parent material

Soils inherit characteristics from the parent material even though the parent material is modified by chemical and physical weathering. For example, the red Triassic sandstones and conglomerates of the Connecticut Valley Lowlands, which bisect the county, create reddish soils from New Haven to Cheshire and Meriden. The grayish granites, gneisses, and schists of the New England Upland areas in the eastern and western parts of the county produce yellower soils that developed over a more grayish or olive colored parent material.

The parent material forms the mineral skeleton of the soils and influences the mineralogy and texture of the soils. Rock fragments contain many kinds of minerals, but if pulverized to sand, silt, and clay sizes, they are often reduced to individual minerals. The soil minerals in New Haven County are mainly quartz, feldspar, and mica. Accessory minerals that comprise less than 10 percent of the total mineral content include horneblende, tourmaline, epidote, biotite mica, magnetite, and garnet. Soils that formed in glacial till derived from basalt and diabase formations contain an abundance of feldspar and quartz and have augite and horneblende as the dominant accessory minerals.

The dominant clay mineral in the parent materials is the micaceous mineral illite, which is often interstratified with vermiculite. Most soils have smaller amounts of chlorite, kaolinite, feldspar, quartz, and hydrated iron oxides. As chemical weathering proceeds, the illite loses its potassium and becomes hydrolized to form vermiculite. Vermiculite is the most abundant clay mineral in the subsoil of most soils in the county.

The parent material of the soils in New Haven County consists of a variety of textures of glacial drift. Glacial till, deposited in place by glaciers, consists of a heterogeneous assortment of particle sizes ranging from large boulders to clay-sized particles. These deposits overlie bedrock at a depth ranging from a few inches to a hundred feet or more. Glacial outwash was deposited when meltwater deposited strata of sand and gravel. The stratified sand and gravel deposits are located primarily in the valleys, but occasional deposits of coarse sand and gravel, called kame terraces or ice-contact deposits, are located high above the valley floor where they were left by melting glacial ice.

The texture of the soils corresponds closely to the texture that was determined by geological events. The texture of the surface layer and that of the subsoil, however, have been modified in many places by physical and chemical weathering, and they are somewhat finer than the texture of the original parent material.

The parent material of the youngest soils in the county consists of recent alluvium that was transported by streams and deposited on the flood plains.

Other young soils in the county are the tidal marshes along the margins of Long Island Sound. Here, daily tidal flow brings small amounts of fresh silt and clay partly from eroding uplands and partly from the floor of Long Island Sound. These sediments are mixed with the organic residues of the salt-tolerant plants that grow in the marshes.

Living organisms

One of the main features that distinguishes a soil from its parent material is its organic constituents, that is, the

living plants and animals and their decayed or decaying remains. After the glacial ice melted, the climate began to act on the parent material. The effects of plant and animal life followed and hastened the weathering process.

Early in soil formation, primitive life such as bacteria, fungi, and other simple living organisms influenced the weathering process. As time progressed, these simple forms of life were supplemented with a more complex plant and animal life. In New Haven County, the dominant form of plant life became forest vegetation. At present the forest cover consists largely of oak, hickory, hemlock, maple, white pine, and mountain laurel.

Vegetation is the most common type of living organism: however, many other forms of life strongly influence soil formation. These include micro-organisms, earthworms, larvae, insects, burrowing animals, and man. They have a significant effect on the decaying and regenerating of vegetation, a process which produces a large amount of organic matter and nutrients. Nutrients that are absorbed by plants are returned to the soil when leaves fall and decay and when the plant itself decays. In this manner, organic matter is produced and is mixed into the upper layers of the soil by earthworms, burrowing animals, and decaying roots. The windthrow of trees and various activities of man also hasten decomposition.

The activities of man have had a profound effect on soil formation during the last few centuries. The clearing and cultivation of land, the use of lime and fertilizer, artificial drainage, grading, and the introduction of new plants are all activities by which man has changed the environment.

Relief

The effect of relief on soil formation is primarily expressed in terms of slope gradient, orientation, and elevation. In places where the parent materials are similar, the soils that formed on steep slopes are thinner and morphology is more poorly expressed than in soils that formed on more gentle slopes.

On landforms that have steep slopes, the orientation of slopes with respect to the sun has a direct effect on vegetation. South-facing slopes are warmer and dryer; north-facing slopes are cooler and more moist. This difference affects the distribution of plant species and the kinds of animal life living on and in the soil.

Elevation in New Haven County ranges from sea level to slightly more than 1,000 feet. The highest features in the Connecticut Valley Lowlands are the Triassic lava flows of basalt and diabase, known locally as traprock. The many ridges in the New England Uplands consist primarily of gneiss and schist. In many places, the smooth drumlins and drumloidal hills on the till plains form a dendritic drainage system with the poorly developed drainageways; the Ridgebury, Leicester, Wilbraham, Whitman, and Menlo soils are on this landscape, and their acreage is extensive.

Deposits of stratified sand and gravel form nearly level to sloping terraces in the major stream valleys. Long narrow areas of alluvial soils are on the flood plains that are adjacent to the larger streams.

Relief influences the drainage condition of soils. Poorly drained soils are in nearly level or concave areas on the landscape. Moderately well drained soils are in nearly level to sloping areas. Well drained soils are mainly in the convex and steeper areas, or they are in nearly level areas and have permeability that is rapid enough that the soils are not saturated for long periods.

Time

The degree of profile expression is dependent on the intensity and duration of the soil forming processes. In terms of pedological time, the soils of New Haven County are relatively young. The horizons of these comparatively young soils are weakly developed except for their color. In the New England Upland areas, where the parent materials are granite, gneiss, and schist, color generally is well developed in the B horizon. In soils that formed in red Triassic sandstone and conglomerate, color development is masked somewhat by the inherited red color of the parent material.

The soils of recent alluvial origin are younger than the soils that formed in glacial drift. They do not have the color development that characterizes the older soils. Many of these alluvial soils continue to receive fresh sediment. This is especially true of the soils in tidal marshes which receive annual increments of silt, clay, and organic matter that has been eroded from surrounding uplands or winnowed from the bottom of Long Island Sound and deposited on the marsh surface by incoming tides.

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Glossary

ABC soil. A soil having an A, a B, and a C horizon.

Ablation till. Loose permeable till deposited during the final downwasting of glacial ice. Lenses of crudely sorted sand and gravel are common.

AC soil. A soil having only an A and a C horizon. Commonly such soil formed in recent alluvium or on steep rocky slopes.

Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alkali (sodic) soil. A soil having so high a degree of alkalinity (pH 8.5 or higher), or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Area reclaim. An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Association, soil. A group of soils geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 40-inch profile or to a limiting layer is expressed as—

	Inches
Very low	less than 2.4
Low	2.4 to 3.2
Moderate	3.2 to 5.2
High	More than 5.2

Basal till. Compact glacial till deposited beneath the ice.

Base saturation. The degree to which material having base exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, K), expressed as a percentage of the exchange capacity.

Bedding planes. Fine stratifications, less than 5 millimeters thick, in unconsolidated alluvial, eolian, lacustrine, or marine sediments.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Bisequum. Two sequences of soil horizons, each of which consists of an illuvial horizon and the overlying eluvial horizons.

Bottom land. The normal flood plain of a stream, subject to frequent flooding.

Boulders. Rock fragments larger than 2 feet (60 centimeters) in diameter.

Calcareous soil. A soil containing enough calcium carbonate (commonly with magnesium carbonate) to effervesce (fizz) visibly when treated with cold, dilute hydrochloric acid. A soil having measurable amounts of calcium carbonate or magnesium carbonate.

Capillary water. Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

Catena. A sequence, or "chain," of soils on a landscape that formed in similar kinds of parent material but have different characteristics as a result of differences in relief and drainage.

Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity, but is more precise in meaning.

Channery soil. A soil, that is, by volume, more than 15 percent thin, flat fragments of sandstone, shale, slate, limestone, or schist as much as 6 inches along the longest axis. A single piece is called a fragment.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coat, clay skin.

Climax vegetation. The stabilized plant community on a particular site. The plant cover reproduces itself and does not change so long as the environment remains the same.

Coarse fragments. Mineral or rock particles up to 10 inches (2 millimeters to 25 centimeters) in diameter.

Coarse textured (light textured) soil. Sand or loamy sand.

Cobblestone (or cobble). A rounded or partly rounded fragment of rock 3 to 10 inches (7.5 to 25 centimeters) in diameter.

Colluvium. Soil material, rock fragments, or both moved by creep, slide, or local wash and deposited at the bases of steep slopes.

Complex slope. Irregular or variable slope. Planning or constructing terraces, diversions, and other water-control measures is difficult.

Complex, soil. A map unit of two or more kinds of soil occurring in such an intricate pattern that they cannot be shown separately on a soil map at the selected scale of mapping and publication.

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrated compounds or cemented soil grains. The composition of most concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are common compounds in concretions.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—

Loose.—Noncoherent when dry or moist; does not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky.—When wet, adheres to other material and tends to stretch somewhat and pull apart rather than to pull free from other material.

Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft.—When dry, breaks into powder or individual grains under very slight pressure.

Cemented.—Hard; little affected by moistening.

Contour stripcropping (or contour farming). Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is 40 or 80 inches (1 or 2 meters).

Corrosive. High risk of corrosion to uncoated steel or deterioration of concrete.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Cutbanks cave. Unstable walls of cuts made by earth-moving equipment. The soil sloughs easily.

Depth to rock. Bedrock at a depth that adversely affects the specified use.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Drainage class (natural). Refers to the frequency and duration of periods of saturation or partial saturation during soil formation, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven classes of natural soil drainage are recognized:

Excessively drained.—Water is removed from the soil very rapidly. Excessively drained soils are commonly very coarse textured, rocky, or shallow. Some are steep. All are free of the mottling related to wetness.

Somewhat excessively drained.—Water is removed from the soil rapidly. Many somewhat excessively drained soils are sandy and rapidly pervious. Some are shallow. Some are so steep that much of the water they receive is lost as runoff. All are free of the mottling related to wetness.

Well drained.—Water is removed from the soil readily, but not rapidly. It is available to plants throughout most of the growing season, and wetness does not inhibit growth of roots for significant periods during most growing seasons. Well drained soils are commonly medium textured. They are mainly free of mottling.

Moderately well drained.—Water is removed from the soil somewhat slowly during some periods. Moderately well drained soils are wet for only a short time during the growing season, but periodically for long enough that most mesophytic crops are affected. They commonly have a slowly pervious layer within or directly below the solum, or periodically receive high rainfall, or both.

Somewhat poorly drained.—Water is removed slowly enough that the soil is wet for significant periods during the growing season. Wetness markedly restricts the growth of mesophytic crops unless artificial drainage is provided. Somewhat poorly drained soils commonly have a slowly pervious layer, a high water table, additional water from seepage, nearly continuous rainfall, or a combination of these.

Poorly drained.—Water is removed so slowly that the soil is saturated periodically during the growing season or remains wet for long periods. Free water is commonly at or near the surface for long enough during the growing season that most mesophytic crops cannot be grown unless the soil is artificially drained. The soil is not continuously saturated in layers directly below plow depth. Poor drainage re-

sults from a high water table, a slowly pervious layer within the profile, seepage, nearly continuous rainfall, or a combination of these.

Very poorly drained.—Water is removed from the soil so slowly that free water remains at or on the surface during most of the growing season. Unless the soil is artificially drained, most mesophytic crops cannot be grown. Very poorly drained soils are commonly level or depressed and are frequently ponded. Yet, where rainfall is high and nearly continuous, they can have moderate or high slope gradients, as for example in "hillpeats" and "climatic moors."

Drainage, surface. Runoff, or surface flow of water, from an area.

Drumlin. A low, smooth, elongated oval hill, mound, or ridge of compact glacial till. The longer axis is parallel to the path of the glacier and commonly has a blunt nose pointing in the direction from which the ice approached.

Erosion. The wearing away of the land surface by running water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of the activities of man or other animals or of a catastrophe in nature, for example, fire, that exposes a bare surface.

Esker (geology). A narrow, winding ridge of stratified gravelly and sandy drift deposited by a stream flowing in a tunnel beneath a glacier.

Excess fines. Excess silt and clay. The soil does not provide a source of gravel or sand for construction purposes.

Excess salts. Excess water soluble salts. Excessive salts restrict the growth of most plants.

Fast intake. The rapid movement of water into the soil.

Favorable. Favorable soil features for the specified use.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity, normal moisture capacity,* or *capillary capacity.*

Fibric soil material (peat). The least decomposed of all organic soil material. Peat contains a large amount of well preserved fiber that is readily identifiable according to botanical origin. Peat has the lowest bulk density and the highest water content at saturation of all organic soil material.

Fine textured (heavy textured) soil. Sandy clay, silty clay, and clay.

Flagstone. A thin fragment of sandstone, limestone, slate, shale, or (rarely) schist, 6 to 15 inches (15 to 37.5 centimeters) long.

Flooding. The temporary covering of soil with water from overflowing streams, runoff from adjacent slopes, and tides. Frequency, duration, and probable dates of occurrence are estimated. Frequency is expressed as none, rare, occasional, and frequent. *None* means that flooding is not probable; *rare* that it is unlikely but possible under unusual weather conditions; *occasional* that it occurs on an average of once or less in 2 years; and *frequent* that it occurs on an average of more than once in 2 years. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, and *long* if more than 7 days. Probable dates are expressed in months; *November-May*, for example, means that flooding can occur during the period November through May. Water standing for short periods after rainfall or commonly covering swamps and marshes is not considered flooding.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Foot slope. The inclined surface at the base of a hill.

Forage. Plant material used as feed by domestic animals. Forage can be grazed or cut for hay.

Forb. Any herbaceous plant not a grass or a sedge.

Fragipan. A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.

Frost action. Freezing and thawing of soil moisture. Frost action can damage structures and plant roots.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Glacial drift (geology). Pulverized and other rock material transported by glacial ice and then deposited. Also the assorted and unassorted material deposited by streams flowing from glaciers.

Glacial outwash (geology). Gravel, sand, and silt, commonly stratified, deposited by melt water as it flows from glacial ice.

Glacial till (geology). Unassorted, nonstratified glacial drift consisting of clay, silt, sand, and boulders transported and deposited by glacial ice.

Glaciofluvial deposits (geology). Material moved by glaciers and subsequently sorted and deposited by streams flowing from the melting ice. The deposits are stratified and occur as kames, eskers, deltas, and outwash plains.

Glaciolacustrine deposits. Material ranging from fine clay to sand derived from glaciers and deposited in glacial lakes by water originating mainly from the melting of glacial ice. Many are interbedded or laminated.

Gleyed soil. A soil having one or more neutral gray horizons as a result of waterlogging and lack of oxygen. The term "gleyed" also designates gray horizons and horizons having yellow and gray mottles as a result of intermittent waterlogging.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel. Rounded or angular fragments of rock up to 3 inches (2 millimeters to 7.5 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material from 15 to 50 percent, by volume, rounded or angular rock fragments, not prominently flattened, up to 3 inches (7.5 centimeters) in diameter.

Ground water (geology). Water filling all the unblocked pores of underlying material below the water table, which is the upper limit of saturation.

Gully. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

Habitat. The natural abode of a plant or animal; refers to the kind of environment in which a plant or animal normally lives, as opposed to the range or geographical distribution.

Hardpan. A hardened or cemented soil horizon, or layer. The soil material is sandy, loamy, or clayey and is cemented by iron oxide, silica, calcium carbonate, or other substance.

Hemic soil material (mucky peat). Organic soil material intermediate in degree of decomposition between the less decomposed fibric and the more decomposed sapric material.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. The major horizons of mineral soil are as follows:

O horizon.—An organic layer, fresh and decaying plant residue, at the surface of a mineral soil.

A horizon.—The mineral horizon, formed or forming at or near the surface, in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon most of which was originally part of a B horizon.

A2 horizon.—A mineral horizon, mainly a residual concentration of sand and silt high in content of resistant minerals as a result of the loss of silicate clay, iron, aluminum, or a combination of these.

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of change from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics caused (1) by accumulation of clay, sesquioxides, humus, or a combination of these; (2) by prismatic or blocky structure; (3) by redder or browner colors than those in the A horizon; or (4) by a combination of these. The combined A and B horizons are generally called the solum, or true soil. If a soil lacks a B horizon, the A horizon alone is the solum.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the A or B horizon. The material of a C horizon may be either like or unlike that from which the solum is presumed to have formed. If the material is known to differ from that in the solum the Roman numeral II precedes the letter C.

R layer.—Consolidated rock beneath the soil. The rock commonly underlies a C horizon, but can be directly below an A or a B horizon.

Hummocky. Refers to a landscape of hillocks, separated by low sags, having sharply rounded tops and steep sides. Hummocky relief resembles rolling or undulating relief, but the tops of ridges are narrower and the sides are shorter and less even.

Humus. The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups. Refers to soils grouped according to their runoff-producing characteristics. The chief consideration is the inherent capacity of soil bare of vegetation to permit infiltration. The slope and the kind of plant cover are not considered, but are separate factors in predicting runoff. Soils are assigned to four groups. In group A are soils having a high infiltration rate when thoroughly wet and having a low runoff potential. They are mainly deep, well drained, and sandy or gravelly. In group D, at the other extreme, are soils having a very slow infiltration rate and thus a high runoff potential. They have a claypan or clay layer at or near the surface, have a permanent high water table, or are shallow over nearly impervious bedrock or other material. A soil is assigned to two hydrologic groups if part of the acreage is artificially drained and part is undrained.

Impervious soil. A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Infiltration capacity. The maximum rate at which water can infiltrate into a soil under a given set of conditions.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Kame (geology). An irregular, short ridge or hill of stratified glacial drift.

Lacustrine deposit (geology). Material deposited in lake water and exposed when the water level is lowered or the elevation of the land is raised.

Large stones. Rock fragments 10 inches (25 centimeters) or more across. Large stones adversely affect the specified use.

Leaching. The removal of soluble material from soil or other material by percolating water.

Light textured soil. Sand and loamy sand.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Low strength. Inadequate strength for supporting loads.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Metamorphic rock. Rock of any origin altered in mineralogical composition, chemical composition, or structure by heat, pressure, and movement. Nearly all such rocks are crystalline.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is greater than that of organic soil.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Miscellaneous areas. Areas that have little or no natural soil, are too nearly inaccessible for orderly examination, or cannot otherwise be feasibly classified.

Moderately coarse textured (moderately light textured) soil. Sandy loam and fine sandy loam.

Moraine (geology). An accumulation of earth, stones, and other debris deposited by a glacier. Types are terminal, lateral, medial, and ground.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Mottling generally indicates poor aeration and impeded drainage. Descriptive terms are as follows: abundance—*few, common,* and *many*; size—*fine, medium,* and *coarse*; and contrast—*faint, distinct,* and *prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium*, from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse*, more than 15 millimeters (about 0.6 inch).

Muck. Dark colored, finely divided, well decomposed organic soil material mixed with mineral soil material. The content of organic matter is more than 20 percent.

Munsell notation. A designation of color by degrees of the three single variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color of 10YR hue, value of 6, and chroma of 4.

Neutral soil. A soil having a pH value between 6.6 and 7.3.

Nutrient, plant. Any element taken in by a plant, essential to its growth, and used by it in the production of food and tissue. Plant nutrients are nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, zinc, and perhaps other elements obtained from the soil; and carbon, hydrogen, and oxygen obtained largely from the air and water.

Outwash, glacial. Stratified sand and gravel produced by glaciers and carried, sorted, and deposited by water that originated mainly from the melting of glacial ice. Glacial outwash is commonly in valleys on landforms known as valley trains, outwash terraces, eskers, kame terraces, kames, outwash fans, or deltas.

Outwash plain. A land form of mainly sandy or coarse textured material of glaciofluvial origin. An outwash plain is commonly smooth; where pitted, it is generally low in relief.

Pan. A compact, dense layer in a soil. A pan impedes the movement of water and the growth of roots. The word "pan" is commonly combined with other words that more explicitly indicate the nature of the layer; for example, *hardpan, fragipan, claypan, plowpan,* and *traffic pan*.

Parent material. The great variety of unconsolidated organic and mineral material in which soil forms. Consolidated bedrock is not yet parent material by this concept.

Peat. Unconsolidated material, largely undecomposed organic matter, that has accumulated under excess moisture.

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10

square meters), depending on the variability of the soil.

Percolation. The downward movement of water through the soil.

Percs slowly. The slow movement of water through the soil adversely affecting the specified use.

Permeability. The quality that enables the soil to transmit water or air, measured as the number of inches per hour that water moves through the soil. Terms describing permeability are *very slow* (less than 0.06 inch), *slow* (0.06 to 0.20 inch), *moderately slow* (0.2 to 0.6 inch), *moderate* (0.6 to 2.0 inches), *moderately rapid* (2.0 to 6.0 inches), *rapid* (6.0 to 20 inches), and *very rapid* (more than 20 inches).

Phase, soil. A subdivision of a soil series or other unit in the soil classification system based on differences in the soil that affect its management. A soil series, for example, may be divided into phases on the bases of differences in slope, stoniness, thickness, or some other characteristic that affects management. These differences are too small to justify separate series.

pH value. (See Reaction, soil). A numerical designation of acidity and alkalinity in soil.

Piping. Moving water forms subsurface tunnels or pipelike cavities in the soil.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from a semisolid to a plastic state.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Polypedon. A volume of soil having properties within the limits of a soil series, the lowest and most homogeneous category of soil taxonomy. A "soil individual."

Poorly graded. Refers to soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Poor outlets. Surface or subsurface drainage outlets difficult or expensive to install.

Productivity (soil). The capability of a soil for producing a specified plant or sequence of plants under a specified system of management. Productivity is measured in terms of output, or harvest, in relation to input.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Reaction, soil. The degree of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degree of acidity or alkalinity is expressed as—

	pH
Extremely acid	Below 4.5
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Medium acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Mildly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Regolith. The unconsolidated mantle of weathered rock and soil material on the earth's surface; the loose earth material above the solid rock. Soil scientists regard as soil only the part of the regolith that is modified by organisms and other soil-building forces. Most engineers describe the whole regolith, even to a great depth, as "soil."

Relief. The elevations or inequalities of a land surface, considered collectively.

Residuum (residual soil material). Unconsolidated, weathered, or partly weathered mineral material that accumulates over disintegrating rock.

Rill. A steep sided channel resulting from accelerated erosion. A rill is generally a few inches deep and not wide enough to be an obstacle to farm machinery.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Rooting depth. Shallow root zone. The soil is shallow over a layer that greatly restricts roots. See Root zone.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged in stream channels from a drainage area. The water that flows off the land surface without sinking in is called surface runoff; that which enters the ground before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Saline-alkali soil. A soil that contains a harmful concentration of salts and exchangeable sodium; contains harmful salts and is strongly alkaline; or contains harmful salts and exchangeable sodium and is very strongly alkaline. The salts, exchangeable sodium, and alkaline reaction are in the soil in such location that growth of most crop plants is less than normal.

Saline soil. A soil containing soluble salts in an amount that impairs growth of plants. A saline soil does not contain excess exchangeable sodium.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sandstone. Sedimentary rock containing dominantly sand-size particles.

Sapric soil material (muck). The most highly decomposed of all organic soil material. Muck has the least amount of plant fiber, the highest bulk density, and the lowest water content at saturation of all organic soil material.

Saprolite (geology). Soft, earthy, clay-rich, thoroughly decomposed rock formed in place by chemical weathering of igneous and metamorphic rock. In soil survey, the term saprolite is applied to any unconsolidated residual material underlying the soil and grading to hard bedrock below.

Sedimentary rock. Rock made up of particles deposited from suspension in water. The chief kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed from clay; and limestone, formed from soft masses of calcium carbonate. There are many intermediate types. Some wind-deposited sand is consolidated into sandstone.

Seepage. The rapid movement of water through the soil. Seepage adversely affects the specified use.

Sequum. A sequence consisting of an illuvial horizon and the overlying eluvial horizon.

Series, soil. A group of soils, formed from a particular type of parent material, having horizons that, except for the texture of the A or surface horizon, are similar in all profile characteristics and in arrangement in the soil profile. Among these characteristics are color, texture, structure, reaction, consistence, and mineralogical and chemical composition.

Shale. Sedimentary rock formed by the hardening of a clay deposit.

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and runoff water.

Shrink-swell. The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75 feet.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

Slow intake. The slow movement of water into the soil.

Small stones. Rock fragments 3 to 10 inches (7.5 to 25 centimeters) in diameter. Small stones adversely affect the specified use.

Soil. A natural, three-dimensional body at the earth's surface that is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes of separates recognized in the United States are as follows: *very coarse sand* (2.0 millimeters to 1.0 millimeter); *coarse sand* (1.0 to 0.5 millimeter); *medium sand* (0.5 to 0.25 millimeter); *fine sand* (0.25 to 0.10 millimeter); *very fine sand* (0.10 to 0.05 millimeter); *silt* (0.005 to 0.002 millimeter); and *clay* (less than 0.002 millimeter).

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in mature soil consists of the A and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and other plant and animal life characteristics of the soil are largely confined to the solum.

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter.

Stony. Refers to a soil containing stones in numbers that interfere with or prevent tillage.

Stratified. Arranged in strata, or layers. The term refers to geologic material. Layers in soils that result from the processes of soil formation are called horizons; those inherited from the parent material are called strata.

Stripcropping. Growing crops in a systematic arrangement of strips or bands which provide vegetative barriers to wind and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates that are separated from adjoining aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Substratum. The part of the soil below the solum.

Surface soil. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use or management.

Terminal moraine. A belt of thick glacial drift that generally marks the termination of important glacial advances.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that it can soak into the soil or flow slowly to a prepared outlet without harm. A terrace in a field is generally built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea. A stream terrace is frequently called a second bottom, in contrast with a flood plain, and is seldom subject to overflow. A marine terrace, generally wide, was deposited by the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt, silt loam, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Thin layer. Otherwise suitable soil material too thin for the specified use.

Tier. An arbitrary division of the control section in Histosols. The tiers are:

Surface tier. A layer of organic material, exclusive of loose surface litter or living mosses, that is 30 cm. (12 inches) thick.

Subsurface tier. A layer, below the surface tier, that is 60 cm. (24 inches) thick unless the control section ends at a lithic or paralithic contact or at water within this depth.

Bottom tier. A layer that is 40 cm. (16 inches) thick unless the control section stops within a depth of 160 cm. (63 inches).

Till plain. An extensive flat to undulating area underlain by glacial till.

Tilth, soil. The condition of the soil, especially the soil structure, as related to the growth of plants. Good tilth refers to the friable state and is associated with high noncapillary porosity and stable structure. A soil in poor tilth is nonfriable, hard, nonaggregated, and difficult to till.

Topsoil (engineering). Presumably a fertile soil or soil material, or one that responds to fertilization, ordinarily rich in organic matter, used to topdress roadbanks, lawns, and gardens.

Upland (geology). Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Unstable fill. Risk of caving or sloughing in banks of fill material.

Valley fill. In glaciated regions, material deposited in stream valleys by glacial melt water. In nonglaciated regions, alluvium deposited by heavily loaded streams emerging from hills or mountains and spreading sediments onto the lowland as a series of adjacent alluvial fans.

Variant, soil. A soil having properties sufficiently different from those of other known soils to justify a new series name, but the limited geographic soil area does not justify creation of a new series.

Variegation. Refers to patterns of contrasting colors assumed to be inherited from the parent material rather than to be the result of poor drainage.

Varve. A sedimentary layer or a lamina or sequence of laminae deposited in a body of still water within 1 year; specifically, a thin pair of graded glaciolacustrine layers seasonally deposited, usually by meltwater streams, in a glacial lake or other body of still water in front of a glacier.

Water table. The upper limit of the soil or underlying rock material that is wholly saturated with water.

Water table, apparent. A thick zone of free water in the soil. An apparent water table is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil.

Water table, artesian. A water table under hydrostatic head, generally beneath an impermeable layer. When this layer is penetrated, the water level rises in an uncased borehole.

Water table, perched. A water table standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone.

Weathering. All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

Well graded. Refers to a soil or soil material consisting of particles well distributed over a wide range in size or diameter. Such a soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Wilting point (or permanent wilting point). The moisture content of soil, on an ovendry basis, at which a plant (specifically sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

ILLUSTRATIONS

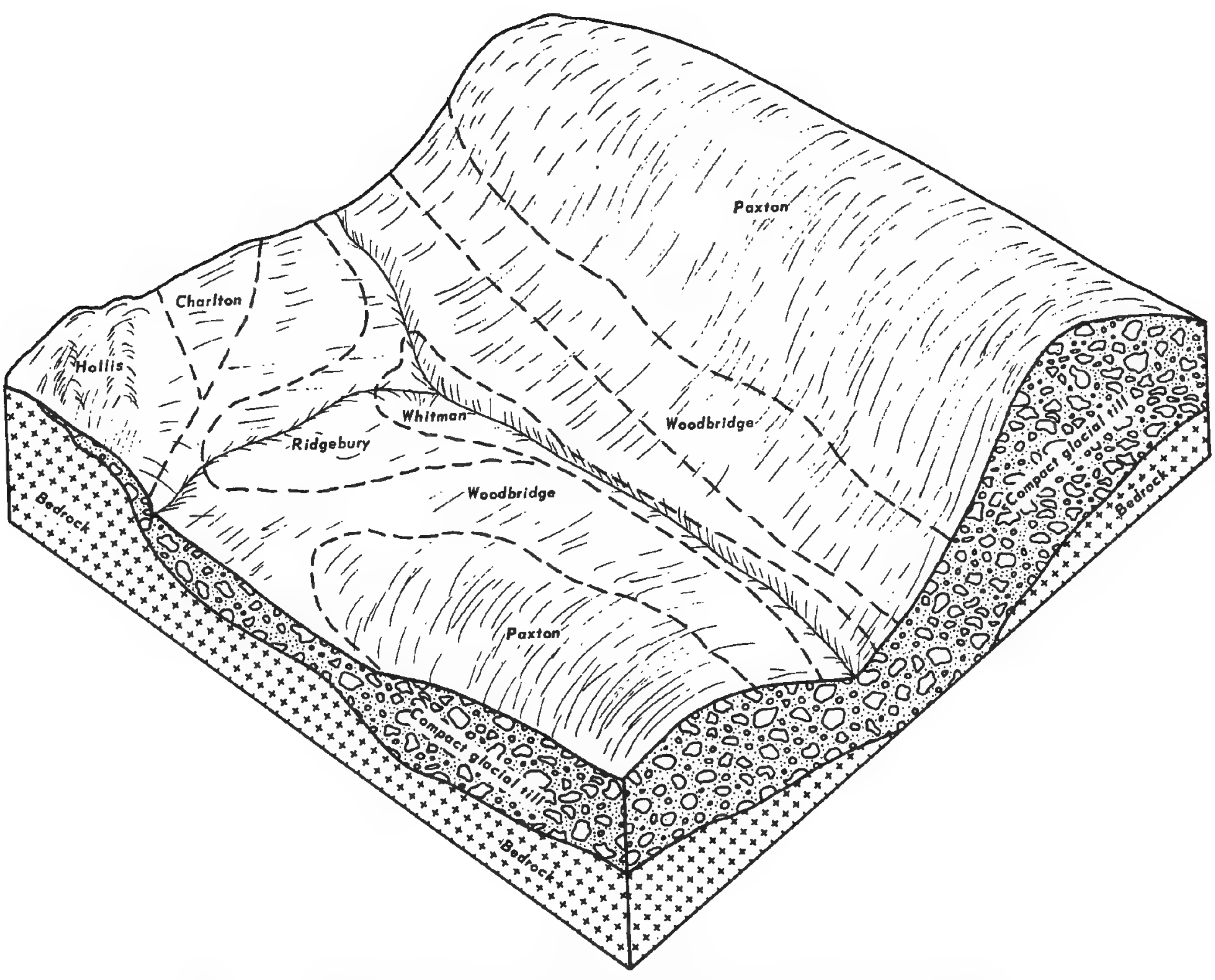

Figure 1.—Typical pattern of soils and parent material in the Paxton-Woodbridge-Ridgebury map unit.

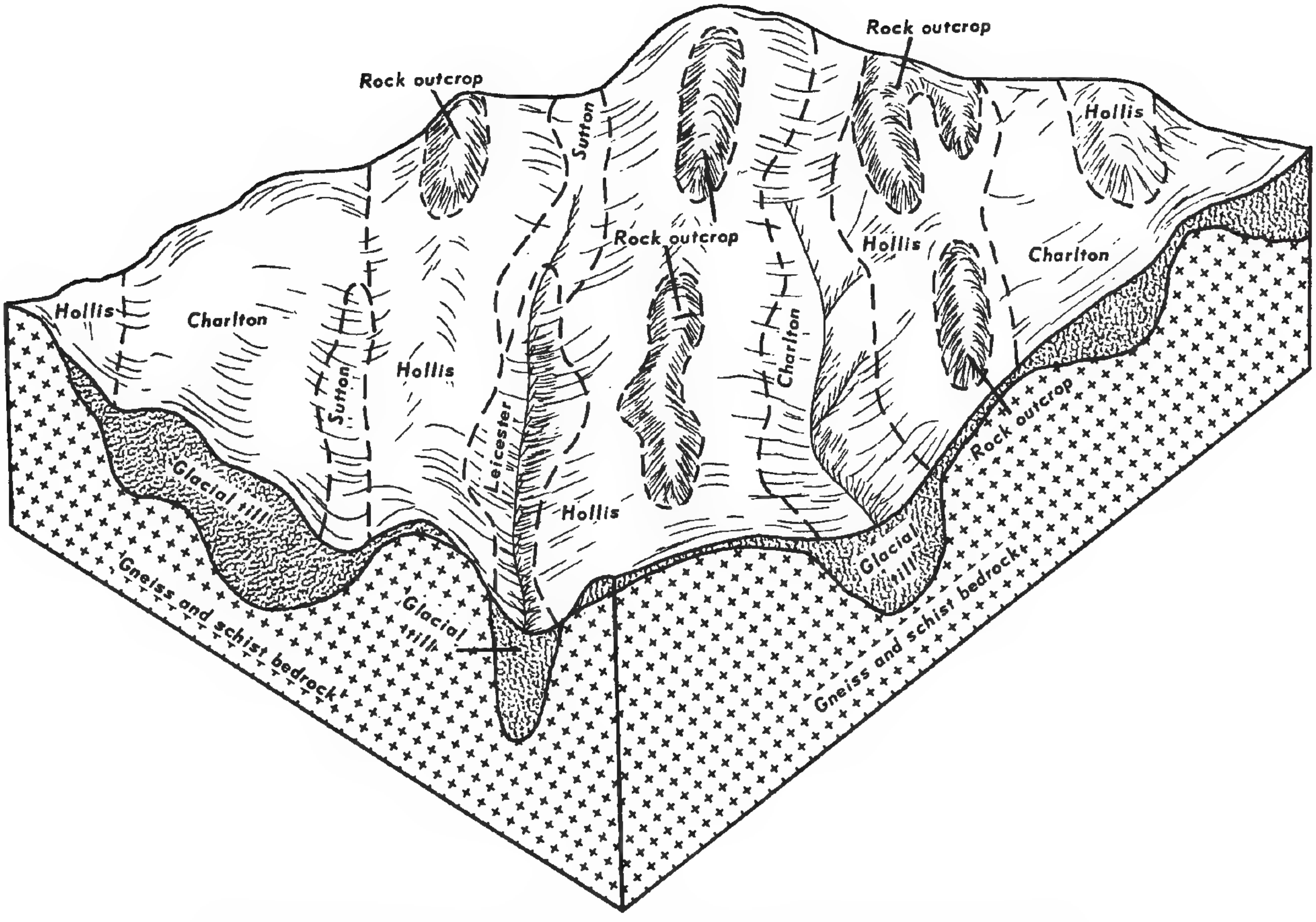

Figure 2.—Typical pattern of soils and parent material in the Hollis-Charlton-Rock outcrop map unit.

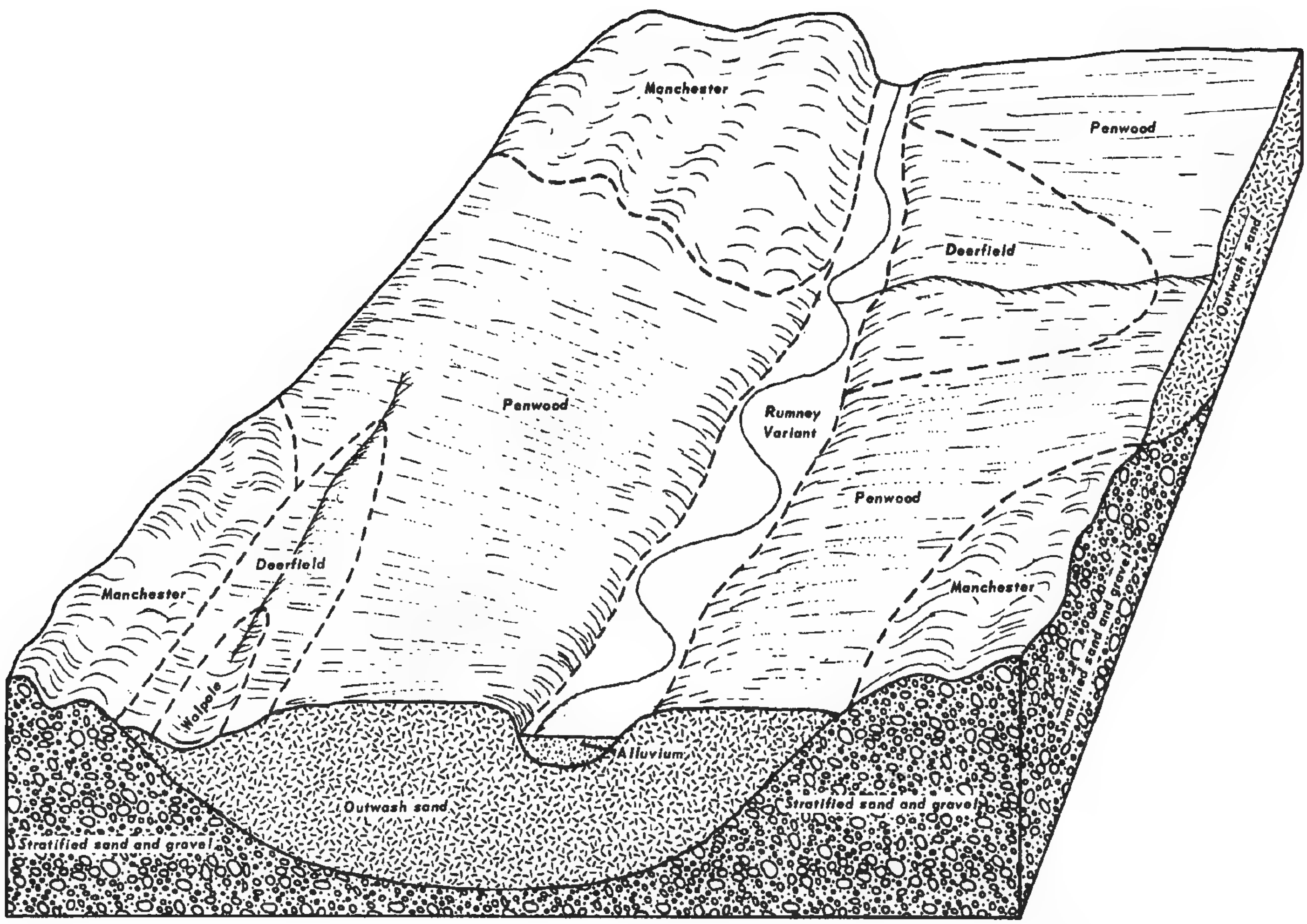

Figure 3.—Typical pattern of soils and parent material in the Penwood-Manchester-Deerfield map unit.

Figure 4.—An area of Agawam fine sandy loam, 3 to 8 percent slopes, near the town of Beacon Falls. This soil is an important source of sand and gravel.

Figure 5.—Many areas of Cheshire-Holyoke complex, 3 to 15 percent slopes, are in orchards.

Figure 6.—Holyoke silt loam, rocky, 3 to 15 percent slopes, is shallow to bedrock. As a result, windthrow of large trees on this soil is common.

Figure 7.—Penwood loamy sand, 0 to 3 percent slopes, is in the foreground, and Agawam fine sandy loam, 0 to 3 percent slopes, is in the background. These soils warm up early in spring. Here, they are used for an early crop of tomatoes.

TABLES

TABLE 1.--TEMPERATURE AND PRECIPITATION

Month	Temperature[1]						Precipitation[1]				
	Average daily maximum	Average daily minimum	Average	2 years in 10 will have-- Maximum temperature higher than--	2 years in 10 will have-- Minimum temperature lower than--	Average number of growing degree days[2]	Average	2 years in 10 will have-- Less than--	2 years in 10 will have-- More than--	Average number of days with 0.10 inch or more	Average snowfall
	°F	°F	°F	°F	°F	Units	In	In	In		In
January-----	36.2	18.4	27.3	56	-8	9	3.21	1.53	4.57	6	7.8
February----	38.6	20.3	29.5	59	-6	9	3.66	2.51	4.71	6	8.6
March-------	45.9	27.7	36.8	69	7	47	4.48	2.77	6.02	7	7.0
April-------	58.6	36.7	47.6	82	20	233	4.30	2.85	5.61	7	.6
May---------	68.6	45.6	57.1	89	30	530	3.76	2.04	5.16	7	.0
June--------	77.8	55.5	66.7	95	39	801	3.34	1.62	4.73	6	.0
July--------	82.7	61.0	71.8	95	47	986	3.62	1.90	5.02	6	.0
August------	81.2	59.6	70.4	93	43	942	3.48	1.92	4.74	6	.0
September---	74.5	52.5	63.5	91	33	705	4.10	2.18	5.66	6	.0
October-----	64.7	42.0	53.4	82	22	415	3.70	1.57	5.42	4	.1
November----	52.0	33.3	42.7	71	13	118	4.57	3.00	5.99	7	.7
December----	40.1	22.6	31.4	63	-1	34	4.51	2.44	6.19	7	7.1
Year------	60.1	39.6	49.9	97	-10	4,829	46.73	39.90	53.27	75	31.9

[1]Recorded in the period 1951-73 at Mt. Carmel, Conn.

[2]A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (40° F).

TABLE 2.--FREEZE DATES IN SPRING AND FALL

Probability	Temperature[1]		
	24°F or lower	28°F or lower	32°F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	April 15	April 28	May 14
2 years in 10 later than--	April 10	April 23	May 10
5 years in 10 later than--	April 1	April 14	April 30
First freezing temperature in fall:			
1 year in 10 earlier than--	October 17	October 10	September 26
2 years in 10 earlier than--	October 24	October 15	October 1
5 years in 10 earlier than--	November 5	October 24	October 11

[1]Recorded in the period 1951-73 at Mt. Carmel, Conn.

TABLE 3.--GROWING SEASON

Probability	Daily minimum temperature during growing season[1]		
	Higher than 24°F	Higher than 28°F	Higher than 32°F
	Days	Days	Days
9 years in 10	192	172	139
8 years in 10	201	179	147
5 years in 10	218	193	163
2 years in 10	234	206	179
1 year in 10	243	213	187

[1]Recorded in the period 1951-73 at Mt. Carmel, Conn.

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Acres	Percent
AA	Adrian and Palms mucks	3,440	0.9
AfA	Agawam fine sandy loam, 0 to 3 percent slopes	2,750	0.7
AfB	Agawam fine sandy loam, 3 to 8 percent slopes	6,830	1.7
AfC	Agawam fine sandy loam, 8 to 15 percent slopes	780	0.2
Ba	Beaches	490	0.1
BoA	Branford silt loam, 0 to 3 percent slopes	3,770	1.0
BoB	Branford silt loam, 3 to 8 percent slopes	4,870	1.2
BoC	Branford silt loam, 8 to 15 percent slopes	540	0.1
BrC	Branford-Holyoke silt loams, 3 to 15 percent slopes	870	0.2
Ce	Carlisle muck	3,780	1.0
CfB	Charlton fine sandy loam, 3 to 8 percent slopes	13,030	3.3
CfC	Charlton fine sandy loam, 8 to 15 percent slopes	5,960	1.5
CfD	Charlton fine sandy loam, 15 to 25 percent slopes	2,180	0.6
ChB	Charlton very stony fine sandy loam, 3 to 8 percent slopes	3,720	1.0
ChC	Charlton very stony fine sandy loam, 8 to 15 percent slopes	3,160	0.8
CnC	Charlton extremely stony fine sandy loam, 3 to 15 percent slopes	7,590	1.9
CnD	Charlton extremely stony fine sandy loam, 15 to 35 percent slopes	2,630	0.7
CrC	Charlton-Hollis fine sandy loams, 3 to 15 percent slopes	34,450	8.8
CsB	Cheshire fine sandy loam, 3 to 8 percent slopes	9,930	2.5
CsC	Cheshire fine sandy loam, 8 to 15 percent slopes	3,280	0.8
CsD	Cheshire fine sandy loam, 15 to 25 percent slopes	1,100	0.3
CtB	Cheshire very stony fine sandy loam, 3 to 8 percent slopes	850	0.2
CtC	Cheshire very stony fine sandy loam, 8 to 15 percent slopes	490	0.1
CvC	Cheshire extremely stony fine sandy loam, 3 to 15 percent slopes	1,180	0.3
CyC	Cheshire-Holyoke complex, 3 to 15 percent slopes	9,180	2.4
De	Deerfield loamy fine sand	1,100	0.3
Du	Dumps	680	0.2
Eh	Ellington silt loam	1,740	0.4
HcA	Haven silt loam, 0 to 3 percent slopes	1,260	0.3
HcB	Haven silt loam, 3 to 8 percent slopes	480	0.1
HkA	Hinckley gravelly sandy loam, 0 to 3 percent slopes	1,610	0.4
HkB	Hinckley gravelly sandy loam, 3 to 8 percent slopes	3,950	1.0
HkC	Hinckley gravelly sandy loam, 8 to 15 percent slopes	2,430	0.6
HME	Hinckley and Manchester soils, 15 to 35 percent slopes	3,680	0.9
HpE	Hollis-Charlton fine sandy loams, 15 to 35 percent slopes	21,350	5.5
HrC	Hollis-Rock outcrop complex, 3 to 15 percent slopes	4,450	1.1
HSE	Hollis-Rock outcrop complex, 15 to 35 percent slopes	12,280	3.1
HtC	Holyoke silt loam, rocky, 3 to 15 percent slopes	1,220	0.3
HuD	Holyoke-Cheshire complex, 15 to 35 percent slopes	6,850	1.8
HyC	Holyoke-Rock outcrop complex, 3 to 15 percent slopes	3,730	1.0
HZE	Holyoke-Rock outcrop complex, 15 to 35 percent slopes	8,430	2.2
Lc	Leicester fine sandy loam	820	0.2
LpA	Ludlow silt loam, 0 to 3 percent slopes	590	0.2
LpB	Ludlow silt loam, 3 to 8 percent slopes	3,130	0.8
LuB	Ludlow very stony silt loam, 3 to 8 percent slopes	680	0.2
LvC	Ludlow extremely stony silt loam, 3 to 15 percent slopes	1,820	0.5
MgA	Manchester gravelly sandy loam, 0 to 3 percent slopes	1,210	0.3
MgB	Manchester gravelly sandy loam, 3 to 8 percent slopes	2,000	0.5
MgC	Manchester gravelly sandy loam, 8 to 15 percent slopes	4,110	1.1
Nn	Ninigret fine sandy loam	1,950	0.5
PbB	Paxton fine sandy loam, 3 to 8 percent slopes	10,020	2.6
PbC	Paxton fine sandy loam, 8 to 15 percent slopes	5,710	1.5
PbD	Paxton fine sandy loam, 15 to 25 percent slopes	2,730	0.7
PdB	Paxton very stony fine sandy loam, 3 to 8 percent slopes	1,900	0.5
PdC	Paxton very stony fine sandy loam, 8 to 15 percent slopes	1,310	0.3
PeC	Paxton extremely stony fine sandy loam, 3 to 15 percent slopes	2,280	0.6
PeD	Paxton extremely stony fine sandy loam, 15 to 35 percent slopes	2,920	0.7
PnA	Penwood loamy sand, 0 to 3 percent slopes	10,390	2.7
PnB	Penwood loamy sand, 3 to 8 percent slopes	1,580	0.4
Pr	Pits, gravel	360	0.1
Ps	Podunk fine sandy loam	1,080	0.3
Pv	Podunk Variant silt loam	310	0.1
Qu	Quarries	250	0.1
Ra	Raynham silt loam	1,390	0.4
Rb	Raypol silt loam	2,380	0.6
Rd	Ridgebury fine sandy loam	580	0.1
RN	Ridgebury, Leicester and Whitman extremely stony fine sandy loams	16,600	4.3
RP	Rock outcrop-Hollis complex	5,190	1.3
Ru	Rumney fine sandy loam	3,640	0.9
Rv	Rumney Variant silt loam	1,800	0.5

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS--Continued

Map symbol	Soil name	Acres	Percent
Sc	Saco silt loam	1,420	0.4
Sr	Scarboro muck	590	0.2
Ss	Scio silt loam	570	0.1
SvA	Sutton fine sandy loam, 0 to 3 percent slopes	280	0.1
SvB	Sutton fine sandy loam, 3 to 8 percent slopes	2,740	0.7
SxC	Sutton extremely stony fine sandy loam, 3 to 15 percent slopes	4,510	1.2
UD	Udorthents, smoothed	20,070	5.1
Ur	Urban land	11,130	2.9
Wa	Walpole sandy loam	2,530	0.6
WcA	Watchaug fine sandy loam, 0 to 3 percent slopes	390	0.1
WcB	Watchaug fine sandy loam, 3 to 8 percent slopes	1,500	0.4
We	Westbrook mucky peat	4,960	1.3
Wh	Westbrook mucky peat, low salt	510	0.1
WkB	Wethersfield loam, 3 to 8 percent slopes	7,440	1.9
WkC	Wethersfield loam, 8 to 15 percent slopes	4,790	1.2
WkD	Wethersfield loam, 15 to 25 percent slopes	1,910	0.5
WmB	Wethersfield very stony loam, 3 to 8 percent slopes	410	0.1
WmC	Wethersfield very stony loam, 8 to 15 percent slopes	530	0.1
WnC	Wethersfield extremely stony loam, 3 to 15 percent slopes	920	0.2
WnD	Wethersfield extremely stony loam, 15 to 35 percent slopes	1,260	0.3
Wr	Wilbraham silt loam	2,360	0.6
Ws	Wilbraham very stony silt loam	1,610	0.4
WT	Wilbraham and Menlo extremely stony silt loams	4,270	1.1
WxA	Woodbridge fine sandy loam, 0 to 3 percent slopes	830	0.2
WxB	Woodbridge fine sandy loam, 3 to 8 percent slopes	5,770	1.5
WyB	Woodbridge very stony fine sandy loam, 3 to 8 percent slopes	1,630	0.4
WzC	Woodbridge extremely stony fine sandy loam, 3 to 15 percent slopes	4,120	1.1
YaB	Yalesville fine sandy loam, 3 to 8 percent slopes	4,690	1.2
YaC	Yalesville fine sandy loam, 8 to 15 percent slopes	3,190	0.8
	Water	2,650	0.7
	Total	390,400	100.0

TABLE 5.--YIELDS PER ACRE OF CROPS AND PASTURE

[Yields are those that can be expected under a high level of management. Absence of data indicates that the soil is not suited to the crop or the crop is not grown on the soil]

Soil name and map symbol	Corn silage	Irish potatoes	Alfalfa hay	Grass-legume hay	Grass hay	Pasture
	Ton	Cwt	Ton	Ton	Ton	AUM
Adrian:						
[2]AA	---	---	---	---	---	---
Agawam:						
AfA	24	330	5.0	4.0	3.5	8.5
AfB	24	330	5.0	4.0	3.5	8.5
AfC	22	300	4.5	3.5	3.5	7.7
Beaches:						
Ba.						
Branford:						
BoA	24	330	4.5	4.0	3.5	8.5
BoB	24	330	4.5	4.0	3.5	8.5
BoC	22	300	4.0	3.5	3.5	7.5
[2]BrC	17	---	3.6	3.2	3.0	6.8
Carlisle:						
Ce.	---	---	---	---	---	---
Charlton:						
CfB	24	330	5.0	4.5	4.0	9.5
CfC	22	300	5.0	4.0	3.5	9.5
CfD	18	---	4.5	3.5	3.0	8.5
ChB, ChC	---	---	---	---	---	---
CnC, CnD	---	---	---	---	---	---
[2]CrC	---	---	---	---	---	---
Cheshire:						
CsB	24	300	4.5	4.0	4.0	8.5
CsC	24	270	4.5	4.0	4.0	8.5
CsD	22	---	4.0	3.5	3.5	8.0
CtB, CtC	---	---	---	---	---	---
CvC	---	---	---	---	---	---
[2]CyC	---	---	---	---	---	---
Deerfield:						
De	16	---	3.5	3.0	3.0	6.5
Dumps:						
Du.						
Ellington:						
Eh	24	330	4.5	4.0	3.5	8.5
Haven:						
HcA	24	400	4.5	3.5	3.5	8.5
HcB	24	400	4.5	3.5	3.5	8.5

See footnotes at end of table.

TABLE 5.--YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Corn silage	Irish potatoes	Alfalfa hay	Grass-legume hay	Grass hay	Pasture
	Ton	Cwt	Ton	Ton	Ton	AUM[1]
Hinckley:						
HkA, HkB	12	---	2.5	2.0	2.0	5.0
HkC	---	---	---	---	---	---
[2]HME	---	---	---	---	---	---
Hollis:						
[2]HpE	---	---	---	---	---	---
[2]HrC	---	---	---	---	---	---
[2]HSE	---	---	---	---	---	---
Holyoke:						
HtC	14	---	3.0	2.5	2.0	5.5
[2]HuD	---	---	---	---	---	---
[2]HyC	---	---	---	---	---	---
[2]HZE	---	---	---	---	---	---
Leicester:						
Lc	16	---	---	3.5	4.0	6.5
Ludlow:						
LpA, LpB	24	300	4.0	4.0	3.5	7.5
LuB	---	---	---	---	---	---
LvC	---	---	---	---	---	---
Manchester:						
MgA, MgB	12	---	2.5	2.0	2.0	5.0
MgC	---	---	---	---	---	---
Ninigret:						
Nn	22	330	4.0	3.5	4.0	7.7
Paxton:						
PbB	24	330	4.5	4.0	4.0	8.5
PbC	22	300	4.5	4.0	4.0	8.5
PbD	20	---	4.0	3.5	3.5	7.5
PdB, PdC	---	---	---	---	---	---
PeC, PeD	---	---	---	---	---	---
Penwood:						
PnA, PnB	14	---	3.0	2.5	2.0	5.5
Pits:						
Pr.						
Podunk:						
Ps	24	300	4.0	4.5	4.5	8.5
Podunk Variant:						
Pv	26	---	3.5	4.0	4.0	---
Quarries:						
Qu.						

See footnotes at end of table.

TABLE 5.--YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Corn silage	Irish potatoes	Alfalfa hay	Grass-legume hay	Grass hay	Pasture
	Ton	Cwt	Ton	Ton	Ton	AUM[1]
Raynham:						
Ra	18	---	---	3.5	4.0	6.5
Raypol:						
Rb	20	---	---	3.5	3.5	6.0
Ridgebury:						
Rd	16	---	---	3.5	4.0	6.5
[2]RN	---	---	---	---	---	---
Rock outcrop:						
[2]RP	---	---	---	---	---	---
Rumney:						
Ru	20	---	---	4.0	3.5	6.5
Rumney Variant:						
Rv	24	---	---	3.5	3.5	7.0
Saco:						
Sc	---	---	---	---	---	---
Scarboro:						
Sr	---	---	---	---	---	---
Scio:						
Ss	22	---	4.5	3.5	3.5	8.0
Sutton:						
SvA, SvB	22	270	4.0	4.0	4.0	7.5
SxC	---	---	---	---	---	---
Urban land:						
Ur.						
Walpole:						
Wa	18	---	---	3.0	3.0	5.5
Watchaug:						
WcA, WcB	22	270	4.0	4.0	4.0	7.5
Westbrook:						
We, Wh	---	---	---	---	---	---
Wethersfield:						
WkB	22	300	4.5	4.0	4.0	8.5
WkC	20	270	4.0	3.5	3.5	7.5
WkD	18	---	3.5	3.5	3.5	7.0
WmB, WmC	---	---	---	---	---	---
WnC, WnD	---	---	---	---	---	---
Wilbraham:						
Wr	16	---	---	3.5	4.0	6.5
Ws	---	---	---	---	---	---
[2]WT	---	---	---	---	---	---
Woodbridge:						
WxA	24	270	4.0	4.0	4.0	8.0
WxB	24	270	4.0	4.0	4.0	8.0

See footnotes at end of table.

TABLE 5.--YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Corn silage	Irish potatoes	Alfalfa hay	Grass-legume hay	Grass hay	Pasture
	Ton	Cwt	Ton	Ton	Ton	AUM[1]
Woodbridge:						
WyB	---	---	---	---	---	---
WzC	---	---	---	---	---	---
Yalesville:						
YaB	19	---	4.0	4.0	3.5	7.5
YaC	18	---	4.0	4.0	3.5	7.5

[1]Animal-unit-month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for a period of 30 days.
[2]This map unit is made up of two or more dominant kinds of soil. See the map unit description for the composition and behavior characteristics of the map unit.

TABLE 6.--CAPABILITY CLASSES AND SUBCLASSES

[Miscellaneous areas excluded. Dashes indicate no acreage]

Class	Total acreage	Major management concerns (Subclass)		
		Erosion (e)	Wetness (w)	Soil problem (s)
		Acres	Acres	Acres
I	7,780	---	---	---
II	78,170	57,290	20,880	---
III	61,590	24,250	16,600	20,740
IV	15,680	7,920	---	7,760
V	590	---	590	---
VI	33,370	---	17,820	15,550
VII	146,930	---	---	146,930
VIII	10,660	---	5,470	5,190

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY

[Only the soils suitable for production of commercial trees are listed in this table. Absence of an entry indicates that the information was not available]

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Management concerns: Windthrow hazard	Potential productivity: Important trees	Potential productivity: Site index	Trees to plant
Adrian:								
[1]AA:								
Adrian part	4w	Slight	Severe	Severe	Severe	Red maple Silver maple White ash	46 --- ---	
Palms part	4w	Slight	Severe	Severe	Severe	Red maple Silver maple White ash	46 --- ---	
Agawam:								
AfA, AfB, AfC	4o	Slight	Slight	Slight	Slight	Eastern white pine Northern red oak Sugar maple	70 65 60	Eastern white pine, white spruce, Norway spruce.
Branford:								
BoA, BoB	3o	Slight	Slight	Slight	Slight	Eastern white pine Northern red oak	75 70	Eastern white pine.
BoC	3r	Moderate	Slight	Slight	Slight	Eastern white pine Northern red oak	75 70	Eastern white pine.
[1]BrC:								
Branford part	3r	Moderate	Slight	Slight	Slight	Eastern white pine Northern red oak	75 70	Eastern white pine.
Holyoke part	5d	Slight	Slight	Severe	Moderate	Northern red oak Eastern white pine	47 55	Eastern white pine.
Carlisle:								
Ce	4w	Slight	Severe	Severe	Severe	Red maple White ash Swamp white oak	46 --- ---	Northern white-cedar, Austrian pine, eastern white pine.
Charlton:								
CfB, CfC, ChB, ChC	4o	Slight	Slight	Slight	Slight	Northern red oak Eastern white pine Red maple	65 65 55	Eastern white pine, white spruce, eastern hemlock, European larch.
CfD	4r	Slight	Moderate	Slight	Slight	Northern red oak Eastern white pine Red maple	65 65 55	Eastern white pine, white spruce, eastern hemlock, European larch.
CnC, CnD	4x	Slight	Moderate	Slight	Slight	Northern red oak Eastern white pine Red maple	65 65 55	Eastern white pine, white spruce, eastern hemlock, European larch.

See footnote at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Potential productivity: Important trees	Site index	Trees to plant
Charlton:								
[1]CrC:								
Charlton part---	4x	Slight	Moderate	Slight	Slight	Northern red oak---- Eastern white pine-- Red maple-----------	65 65 55	Eastern white pine, white spruce, eastern hemlock, European larch.
Hollis part------	5d	Slight	Slight	Severe	Moderate	Northern red oak---- Eastern white pine-- Sugar maple---------	47 55 56	Eastern white pine.
Cheshire:								
CsB, CsC, CtB, CtC	4o	Slight	Slight	Slight	Slight	Northern red oak---- Eastern white pine--	60 65	Eastern white pine, white spruce, eastern hemlock.
CsD---------------	4r	Slight	Moderate	Slight	Slight	Northern red oak---- Eastern white pine--	60 65	Eastern white pine, white spruce, eastern hemlock.
CvC---------------	4x	Slight	Moderate	Slight	Slight	Northern red oak---- Eastern white pine--	60 65	Eastern white pine, white spruce, eastern hemlock.
[1]CyC:								
Cheshire part---	4o	Slight	Slight	Slight	Slight	Northern red oak---- Eastern white pine--	60 65	Eastern white pine, white spruce, eastern hemlock.
Holyoke part----	5d	Slight	Slight	Severe	Moderate	Northern red oak---- Eastern white pine--	47 55	Eastern white pine.
Deerfield:								
De----------------	4s	Slight	Slight	Slight	Slight	Eastern white pine-- Northern red oak----	65 55	Eastern white pine, European larch.
Ellington:								
Eh----------------	3o	Slight	Slight	Slight	Slight	Eastern white pine-- Northern red oak----	75 70	Eastern white pine.
Haven:								
HcA, HcB----------	3o	Slight	Slight	Slight	Slight	Eastern white pine-- Northern red oak---- Sugar maple---------	75 55 65	Eastern white pine, Norway spruce, European larch.
Hinckley:								
HkA, HkB, HkC-----	5s	Slight	Slight	Severe	Slight	Northern red oak---- Eastern white pine-- Sugar maple---------	49 60 57	Eastern white pine, European larch.
[1]HME:								
Hinckley part---	5s	Slight	Moderate	Severe	Slight	Northern red oak---- Eastern white pine-- Sugar maple---------	49 60 57	Eastern white pine, European larch.
Manchester part-	5s	Slight	Moderate	Severe	Slight	Northern red oak---- Eastern white pine--	50 55	Eastern white pine, European larch.

See footnote at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Management concerns: Windthrow hazard	Potential productivity: Important trees	Potential productivity: Site index	Trees to plant
Hollis:								
[1]HpE:								
Hollis part	5d	Slight	Moderate	Severe	Moderate	Northern red oak	47	Eastern white pine.
						Eastern white pine	55	
						Sugar maple	56	
Charlton part	4x	Slight	Moderate	Slight	Slight	Northern red oak	65	Eastern white pine, white spruce, eastern hemlock, European larch.
						Eastern white pine	65	
[1]HrC:								
Hollis part	5d	Slight	Slight	Severe	Moderate	Northern red oak	47	Eastern white pine.
						Eastern white pine	55	
						Sugar maple	56	
Rock outcrop part.								
[1]HSE:								
Hollis part	5d	Slight	Moderate	Severe	Moderate	Northern red oak	47	Eastern white pine.
						Eastern white pine	55	
						Sugar maple	56	
Rock outcrop part.								
Holyoke:								
HtC	5d	Slight	Slight	Severe	Moderate	Northern red oak	47	Eastern white pine.
						Eastern white pine	55	
[1]HuD:								
Holyoke part	5d	Moderate	Moderate	Severe	Moderate	Northern red oak	47	Eastern white pine.
						Eastern white pine	55	
Cheshire part	4r	Slight	Moderate	Slight	Slight	Northern red oak	60	Eastern white pine, white spruce, eastern hemlock.
						Eastern white pine	65	
[1]HyC:								
Holyoke part	5d	Slight	Slight	Severe	Moderate	Northern red oak	47	Eastern white pine.
						Eastern white pine	55	
Rock outcrop part.								
[1]HZE:								
Holyoke part	5d	Moderate	Moderate	Severe	Moderate	Northern red oak	47	Eastern white pine.
						Eastern white pine	55	
Rock outcrop part.								

See footnote at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Potential productivity: Important trees	Site index	Trees to plant
Leicester:								
Lc	4w	Slight	Severe	Severe	Severe	Northern red oak Eastern white pine	56 69	Eastern white pine, white spruce, northern white-cedar.
Ludlow:								
LpA, LpB, LuB	3o	Slight	Slight	Slight	Slight	Northern red oak Eastern white pine	70 75	Eastern white pine, European larch.
LvC	3x	Slight	Moderate	Slight	Slight	Northern red oak Eastern white pine	70 75	Eastern white pine, European larch.
Manchester:								
MgA, MgB, MgC	5s	Slight	Slight	Severe	Slight	Northern red oak Eastern white pine	50 55	Eastern white pine.
Ninigret:								
Nn	3o	Slight	Slight	Slight	Slight	Eastern white pine	75	Eastern white pine, white spruce.
Paxton:								
PbB, PbC, PdB, PdC	3o	Slight	Slight	Slight	Slight	Northern red oak Eastern white pine Sugar maple	65 66 75	Eastern white pine, Norway spruce, European larch.
PbD	3r	Slight	Moderate	Slight	Slight	Northern red oak Eastern white pine Sugar maple	65 66 75	Eastern white pine, Norway spruce, European larch.
PeC	3x	Slight	Moderate	Slight	Slight	Northern red oak Eastern white pine Sugar maple	65 66 75	Eastern white pine, Norway spruce, European larch.
PeD	3x	Slight	Moderate	Slight	Slight	Northern red oak Eastern white pine Sugar maple	65 66 75	Eastern white pine, Norway spruce, European larch.
Penwood:								
PnA, PnB	5s	Slight	Slight	Severe	Slight	Eastern white pine Northern red oak Pitch pine	55 50 50	Eastern white pine.
Podunk:								
Ps	3o	Slight	Slight	Slight	Slight	Eastern white pine	75	Eastern white pine, white spruce.
Podunk Variant:								
Pv	3o	Slight	Slight	Slight	Slight	Northern red oak Eastern white pine	65 75	Eastern white pine, European larch.
Raynham:								
Ra	4w	Slight	Severe	Severe	Severe	Eastern white pine	65	Eastern white pine, white spruce, northern white-cedar.

See footnote at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Management concerns: Windthrow hazard	Potential productivity: Important trees	Potential productivity: Site index	Trees to plant
Raypol:								
Rb	4w	Slight	Severe	Severe	Severe	Eastern white pine	68	Eastern white pine, eastern hemlock, white spruce, northern white-cedar.
						Red maple	75	
Ridgebury:								
Rd	4w	Slight	Severe	Severe	Severe	Northern red oak	57	Eastern white pine, white spruce.
						Eastern white pine	63	
						Sugar maple	52	
[1]RN:								
Ridgebury part	4x	Slight	Severe	Severe	Severe	Northern red oak	57	Eastern white pine, white spruce.
						Eastern white pine	63	
						Sugar maple	52	
Leicester part	4x	Slight	Severe	Severe	Severe	Northern red oak	56	Eastern white pine, white spruce,
						Eastern white pine	69	
Whitman part	5x	Slight	Severe	Severe	Severe	Eastern white pine	56	
						Red maple	55	
Rock outcrop:								
[1]RP:								
Rock outcrop part.								
Hollis part	5d	Slight	Moderate	Severe	Moderate	Northern red oak	47	Eastern white pine.
						Eastern white pine	55	
						Sugar maple	56	
Rumney:								
Ru	4w	Slight	Severe	Severe	Severe	Eastern white pine	59	Eastern white pine, white spruce.
						Red maple	65	
Rumney Variant:								
Rv	4w	Slight	Severe	Severe	Severe	Eastern white pine	65	Eastern white pine, eastern hemlock, Atlantic white-cedar.
						Red maple	75	
Scarboro:								
Sr	5w	Slight	Severe	Severe	Severe	Eastern white pine	55	Northern white-cedar.
						Red maple	55	
Scio:								
Ss	3o	Slight	Slight	Slight	Slight	Northern red oak	75	European larch, eastern white pine.
						White ash	---	
						Sugar maple	---	
						Eastern white pine	---	
Sutton:								
SvA, SvB	4o	Slight	Slight	Slight	Slight	Sugar maple	54	Eastern white pine, white spruce, European larch, Norway spruce.
						Northern red oak	62	
						Eastern white pine	62	
						Black cherry	72	
SxC	4x	Slight	Moderate	Slight	Slight	Northern red oak	62	European larch, Norway spruce, eastern white pine, white spruce.
						Eastern white pine	62	
						Black cherry	72	
						Sugar maple	54	

See footnote at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Management concerns: Windthrow hazard	Potential productivity: Important trees	Potential productivity: Site index	Trees to plant
Walpole:								
Wa	4w	Slight	Severe	Severe	Severe	Eastern white pine	68	Eastern white pine, white spruce, northern white-cedar, Norway spruce.
						Red maple	75	
Watchaug:								
WcA, WcB	4o	Slight	Slight	Slight	Slight	Eastern white pine	65	Eastern white pine, white spruce.
						Northern red oak	65	
Wethersfield:								
WkB, WkC, WmB, WmC	3o	Slight	Slight	Slight	Slight	Northern red oak	74	Eastern white pine.
						Eastern white pine	75	
						Sugar maple	63	
						Yellow-poplar	87	
WkD	3r	Slight	Moderate	Slight	Slight	Northern red oak	74	Eastern white pine.
						Eastern white pine	75	
						Sugar maple	63	
						Yellow-poplar	87	
WnC, WnD	3x	Slight	Moderate	Slight	Slight	Northern red oak	74	Eastern white pine.
						Eastern white pine	75	
						Sugar maple	63	
						Yellow-poplar	87	
Wilbraham:								
Wr, Ws	4w	Slight	Severe	Severe	Severe	Northern red oak	63	Eastern white pine, white spruce.
						Eastern white pine	65	
						Sugar maple	55	
						Red maple	70	
[1]WT:								
Wilbraham part	4x	Slight	Severe	Severe	Severe	Northern red oak	63	Eastern white pine, white spruce.
						Eastern white pine	65	
						Sugar maple	55	
						Red maple	70	
Menlo part	5x	Slight	Severe	Severe	Severe	Red maple	55	
						Eastern white pine	55	
Woodbridge:								
WxA, WxB	3o	Slight	Slight	Slight	Slight	Eastern white pine	67	Eastern white pine, European larch.
						Northern red oak	72	
						Sugar maple	65	
WyB	3o	Slight	Slight	Slight	Slight	Eastern white pine	67	Eastern white pine, European larch.
						Northern red oak	72	
						Sugar maple	65	
WzC	3x	Moderate	Moderate	Slight	Slight	Sugar maple	65	Eastern white pine, European larch.
						Eastern white pine	67	
						Northern red oak	72	
Yalesville:								
YaB, YaC	4o	Slight	Slight	Slight	Moderate	Northern red oak	60	Eastern white pine.
						Eastern white pine	65	
						Sugar maple	---	

[1]This map unit is made up of two or more dominant kinds of soil. See the map unit description for the composition and behavior characteristics of the map unit.

TABLE 8.--BUILDING SITE DEVELOPMENT

[Some of the terms used in this table to describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry means soil was not rated]

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
Adrian:						
[1]AA:						
Adrian part	Severe: wetness, cutbanks cave, excess humus.	Severe: wetness, frost action, excess humus.	Severe: wetness, excess humus.	Severe: wetness, frost action, excess humus.	Severe: wetness, frost action, low strength, excess humus.	Severe: excess humus, wetness.
Palms part	Severe: wetness, excess humus, cutbanks cave.	Severe: wetness, frost action, excess humus.	Severe: wetness, excess humus.	Severe: wetness, frost action, excess humus.	Severe: wetness, frost action, low strength, excess humus.	Severe: wetness, excess humus.
Agawam:						
AfA	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Slight.
AfB	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Slight	Slight.
AfC	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: slope.
Beaches:						
Ba.						
Branford:						
BoA	Severe: small stones, cutbanks cave.	Moderate: frost action.	Slight	Moderate: frost action.	Moderate: frost action.	Slight.
BoB	Severe: small stones, cutbanks cave.	Moderate: frost action.	Slight	Moderate: slope, frost action.	Moderate: frost action.	Slight.
BoC	Severe: small stones, cutbanks cave.	Moderate: slope, frost action.	Moderate: slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: slope.
[1]BrC:						
Branford part	Severe: small stones, cutbanks cave.	Moderate: slope, frost action.	Moderate: slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: slope.
Holyoke part	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Severe: depth to rock.
Carlisle:						
Ce	Severe: wetness, cutbanks cave, excess humus.	Severe: wetness, low strength, excess humus, frost action.	Severe: wetness, low strength, excess humus.	Severe: wetness, low strength, excess humus, frost action.	Severe: excess humus, wetness, floods, low strength.	Severe: excess humus, wetness.
Charlton:						
CfB	Slight	Slight	Slight	Moderate: slope.	Slight	Slight.
CfC	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: slope.
CfD	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.

See footnote at end of table.

TABLE 8.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
Charlton:						
ChB	Moderate: large stones.	Moderate: large stones.	Moderate: large stones.	Moderate: large stones, slope.	Slight	Moderate: large stones.
ChC	Moderate: large stones, slope.	Moderate: large stones, slope.	Moderate: large stones, slope.	Severe: slope.	Moderate: slope.	Moderate: large stones, slope.
CnC	Severe: large stones.	Severe: large stones.	Severe: large stones.	Severe: slope, large stones.	Moderate: large stones.	Severe: large stones.
CnD	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope.	Severe: slope, large stones.
[1]CrC:						
Charlton part	Severe: large stones.	Severe: large stones.	Severe: large stones.	Severe: slope, large stones.	Moderate: large stones.	Severe: large stones.
Hollis part	Severe: depth to rock, large stones.	Severe: depth to rock, large stones.	Severe: depth to rock, large stones.	Severe: slope, depth to rock, large stones.	Severe: depth to rock.	Severe: depth to rock, large stones.
Cheshire:						
CsB	Slight	Slight	Slight	Moderate: slope.	Slight	Slight.
CsC	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: slope.
CsD	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
CtB	Moderate: large stones.	Moderate: large stones.	Moderate: large stones.	Moderate: large stones, slope.	Slight	Moderate: large stones.
CtC	Moderate: large stones, slope.	Moderate: large stones, slope.	Moderate: large stones, slope.	Severe: slope.	Moderate: slope.	Moderate: large stones, slope.
CvC	Severe: large stones.	Severe: large stones.	Severe: large stones.	Severe: large stones, slope.	Moderate: large stones, slope.	Severe: large stones.
[1]CyC:						
Cheshire part	Moderate: large stones, slope.	Moderate: large stones, slope.	Moderate: large stones, slope.	Severe: slope.	Moderate: slope.	Moderate: large stones, slope.
Holyoke part	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Severe: depth to rock.
Deerfield:						
De	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Moderate: frost action.	Severe: too sandy.
Dumps:						
Du.						
Ellington:						
Eh	Severe: wetness, small stones, cutbanks cave.	Severe: frost action.	Severe: wetness.	Severe: frost action.	Severe: frost action.	Slight.

See footnote at end of table.

TABLE 8.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
Haven:						
HoA	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Slight.
HoB	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Slight	Slight.
Hinckley:						
HkA	Severe: small stones, cutbanks cave.	Slight	Slight	Slight	Slight	Severe: small stones, droughty.
HkB	Severe: small stones, cutbanks cave.	Slight	Slight	Moderate: slope.	Slight	Severe: small stones, droughty.
HkC	Severe: small stones, cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Severe: small stones, droughty.
[1]HME:						
Hinckley part	Severe: slope, small stones, cutbanks cave.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, small stones, droughty.
Manchester part	Severe: slope, small stones, cutbanks cave.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, small stones, droughty.
Hollis:						
[1]HpE:						
Hollis part	Severe: slope, depth to rock, large stones.	Severe: slope, depth to rock, large stones.	Severe: slope, depth to rock, large stones.	Severe: slope, depth to rock, large stones.	Severe: slope, depth to rock.	Severe: slope, depth to rock, large stones.
Charlton part	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope.	Severe: slope, large stones.
[1]HrC:						
Hollis part	Severe: depth to rock, large stones.	Severe: depth to rock, large stones.	Severe: depth to rock, large stones.	Severe: slope, depth to rock, large stones.	Severe: depth to rock.	Severe: depth to rock, large stones.
Rock outcrop part.						
[1]HSE:						
Hollis part	Severe: slope, depth to rock, large stones.	Severe: slope, depth to rock, large stones.	Severe: slope, depth to rock, large stones.	Severe: slope, depth to rock, large stones.	Severe: slope, depth to rock.	Severe: slope, depth to rock, large stones.
Rock outcrop part.						
Holyoke:						
HtC	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Severe: depth to rock.
[1]HuD:						
Holyoke part	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.

See footnote at end of table.

TABLE 8.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
Holyoke:						
[1]HuD:						
Cheshire part	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
[1]HyC:						
Holyoke part	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Severe: depth to rock.
Rock outcrop part.						
[1]HZE:						
Holyoke part	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.
Rock outcrop part.						
Leicester:						
Lc	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness, frost action.	Severe: wetness.
Ludlow:						
LpA, LpB	Severe: wetness.	Severe: frost action.	Severe: wetness.	Severe: frost action.	Severe: frost action.	Slight.
LuB	Severe: wetness.	Severe: frost action.	Severe: wetness.	Severe: frost action.	Severe: frost action.	Moderate: large stones.
LvC	Severe: large stones, wetness.	Severe: large stones, frost action.	Severe: large stones, wetness.	Severe: slope, large stones, frost action.	Severe: frost action.	Severe: large stones.
Manchester:						
MgA	Severe: small stones, cutbanks cave.	Slight	Slight	Slight	Slight	Severe: small stones, droughty.
MgB	Severe: small stones, cutbanks cave.	Slight	Slight	Moderate: slope.	Slight	Severe: small stones, droughty.
MgC	Severe: small stones, cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Severe: small stones, droughty.
Ninigret:						
Nn	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: frost action.	Slight.
Paxton:						
PbB	Slight	Moderate: frost action.	Slight	Moderate: frost action, slope.	Moderate: frost action.	Slight.
PbC	Moderate: slope.	Moderate: frost action, slope.	Moderate: slope.	Severe: slope.	Moderate: frost action, slope.	Moderate: slope.
PbD	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
PdB	Moderate: large stones.	Moderate: frost action, large stones.	Moderate: large stones.	Moderate: frost action, large stones.	Moderate: frost action.	Moderate: large stones.
PdC	Moderate: slope, large stones.	Moderate: frost action, slope, large stones.	Moderate: slope, large stones.	Severe: slope.	Moderate: frost action, slope.	Moderate: large stones, slope.

See footnote at end of table.

TABLE 8.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
Paxton:						
PeC	Severe: large stones.	Severe: large stones.	Severe: large stones.	Severe: slope, large stones.	Moderate: frost action, slope, large stones.	Severe: large stones.
PeD	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.
Penwood:						
PnA	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Severe: too sandy, droughty.
PnB	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Slight	Severe: too sandy, droughty.
Pits: Pr.						
Podunk:						
Ps	Severe: floods, wetness.	Severe: floods.	Severe: floods, wetness.	Severe: floods.	Severe: floods.	Severe: floods.
Podunk Variant:						
Pv	Severe: floods, wetness.	Severe: floods, frost action.	Severe: floods, wetness.	Severe: floods, frost action.	Severe: floods, frost action.	Severe: floods.
Quarries: Qu.						
Raynham:						
Ra	Severe: wetness.	Severe: frost action, wetness.	Severe: wetness.	Severe: frost action, wetness.	Severe: frost action, wetness.	Severe: wetness.
Raypol:						
Rb	Severe: wetness, cutbanks cave.	Severe: wetness, frost action.	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness, frost action.	Severe: wetness.
Ridgebury:						
Rd	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness, frost action.	Severe: wetness.
[1]RN:						
Ridgebury part	Severe: wetness, large stones.	Severe: wetness, frost action, large stones.	Severe: wetness, large stones.	Severe: wetness, frost action, large stones.	Severe: wetness, frost action.	Severe: wetness, large stones.
Leicester part	Severe: large stones, wetness.	Severe: large stones, wetness, frost action.	Severe: large stones, wetness.	Severe: large stones, wetness, frost action.	Severe: wetness, frost action.	Severe: wetness, large stones.
Whitman part	Severe: wetness, large stones.	Severe: wetness, frost action, large stones.	Severe: wetness, large stones.	Severe: wetness, frost action, large stones.	Severe: wetness, frost action.	Severe: wetness, large stones.
Rock outcrop:						
[1]RP:						
Rock outcrop part.						

See footnote at end of table.

TABLE 8.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
[1]RP:						
Hollis part	Severe: slope, depth to rock, large stones.	Severe: slope, depth to rock, large stones.	Severe: slope, depth to rock, large stones.	Severe: slope, depth to rock, large stones.	Severe: slope, depth to rock.	Severe: slope, depth to rock, large stones.
Rumney:						
Ru	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness, frost action.	Severe: floods, wetness.
Rumney Variant:						
Rv	Severe: floods, wetness.	Severe: floods, wetness, frost action.	Severe: floods, wetness.	Severe: floods, wetness, frost action.	Severe: floods, wetness, frost action.	Severe: floods, wetness.
Saco:						
Sc	Severe: floods, wetness.	Severe: floods, wetness, frost action.	Severe: floods, wetness.	Severe: floods, wetness, frost action.	Severe: floods, wetness, frost action.	Severe: floods, wetness.
Scarboro:						
Sr	Severe: wetness, cutbanks cave.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Scio:						
Ss	Severe: wetness.	Moderate: wetness, frost action.	Severe: wetness.	Moderate: wetness, frost action.	Severe: frost action.	Slight.
Sutton:						
SvA	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: frost action.	Slight.
SvB	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: slope, wetness.	Moderate: frost action.	Slight.
SxC	Severe: wetness, large stones.	Severe: large stones.	Severe: large stones, wetness.	Severe: slope, large stones.	Moderate: slope, large stones, frost action.	Severe: large stones.
Urban land:						
Ur.						
Walpole:						
Wa	Severe: wetness, cutbanks cave.	Severe: wetness, frost action.	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness, frost action.	Severe: wetness.
Watchaug:						
WcA	Severe: wetness.	Moderate: wetness, frost action.	Severe: wetness.	Moderate: wetness, frost action.	Moderate: frost action.	Slight.
WcB	Severe: wetness.	Moderate: wetness, frost action.	Severe: wetness.	Moderate: slope, wetness, frost action.	Moderate: frost action.	Slight.
Westbrook:						
We, Wh	Severe: wetness, floods, excess humus.	Severe: wetness, floods, excess humus.	Severe: wetness, floods, excess humus.	Severe: floods, excess humus, wetness.	Severe: wetness, low strength, floods, excess humus.	Severe: wetness, floods, excess salt, excess humus.

See footnote at end of table.

TABLE 8.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
Wethersfield:						
WkB	Slight	Moderate: frost action.	Slight	Moderate: frost action, slope.	Moderate: frost action.	Slight.
WkC	Moderate: slope.	Moderate: frost action, slope.	Moderate: slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: slope.
WkD	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
WmB	Moderate: large stones.	Moderate: frost action, large stones.	Moderate: large stones.	Moderate: slope, frost action, large stones.	Moderate: frost action.	Moderate: large stones.
WmC	Moderate: slope, large stones.	Moderate: slope, frost action, large stones.	Moderate: large stones, slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: slope, large stones.
WnC	Severe: large stones.	Severe: large stones.	Severe: large stones.	Severe: slope, large stones.	Moderate: slope, frost action.	Severe: large stones.
WnD	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope.	Severe: slope, large stones.
Wilbraham:						
Wr	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness, frost action.	Severe: wetness.
Ws	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness, frost action.	Severe: wetness.
[1]WT:						
Wilbraham part	Severe: wetness, large stones.	Severe: wetness, large stones, frost action.	Severe: wetness, large stones.	Severe: wetness, large stones, frost action.	Severe: wetness, frost action.	Severe: wetness, large stones.
Menlo part	Severe: wetness, large stones.	Severe: wetness, frost action, large stones.	Severe: wetness, large stones.	Severe: wetness, frost action, large stones.	Severe: wetness, frost action.	Severe: wetness, large stones.
Woodbridge:						
WxA, WxB	Severe: wetness.	Severe: frost action.	Severe: wetness.	Severe: frost action.	Severe: frost action.	Slight.
WyB	Severe: wetness.	Severe: frost action.	Severe: wetness.	Severe: frost action.	Severe: frost action.	Moderate: large stones.
WzC	Severe: wetness, large stones.	Severe: frost action, large stones.	Severe: wetness, large stones.	Severe: slope, frost action, large stones.	Severe: frost action.	Severe: large stones.
Yalesville:						
YaB	Severe: depth to rock.	Moderate: depth to rock.	Severe: depth to rock.	Moderate: slope, depth to rock.	Moderate: depth to rock.	Moderate: depth to rock.
YaC	Severe: depth to rock.	Moderate: slope, depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Moderate: slope, depth to rock.	Moderate: slope, depth to rock.

[1]This map unit is made up of two or more dominant kinds of soil. See the map unit description for the composition and behavior characteristics of the map unit.

TABLE 9.--SANITARY FACILITIES

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," "good," "fair," and other terms used to rate soils. Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Adrian:					
[1]AA:					
Adrian part	Severe: wetness, floods.	Severe: wetness, excess humus, seepage.	Severe: wetness, floods, seepage, excess humus.	Severe: wetness, floods, seepage,	Poor: excess humus, hard to pack, wetness.
Palms part	Severe: wetness, floods.	Severe: wetness, excess humus, seepage.	Severe: wetness, floods, seepage, excess humus.	Severe: wetness, floods, seepage.	Poor: excess humus, hard to pack, wetness.
Agawam:					
AfA, AfB	Slight	Severe: seepage.	Severe: seepage.	Severe: seepage.	Fair: thin layer, area reclaim.
AfC	Moderate: slope.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Fair: slope, thin layer, area reclaim.
Beaches:					
Ba.					
Branford:					
BoA, BoB	Slight	Severe: seepage.	Severe: seepage.	Severe: seepage.	Fair: thin layer, area reclaim.
BoC	Moderate: slope.	Severe: slope, seepage.	Severe: seepage.	Severe: seepage.	Fair: slope, thin layer, area reclaim.
[1]BrC:					
Branford part	Moderate: slope.	Severe: slope, seepage.	Severe: seepage.	Severe: seepage.	Fair: slope, thin layer, area reclaim.
Holyoke part	Severe: depth to rock.	Severe: slope, depth to rock, seepage.	Severe: depth to rock, seepage.	Severe: seepage.	Poor: thin layer, area reclaim.
Carlisle:					
Ce	Severe: floods, wetness.	Severe: wetness, excess humus, seepage.	Severe: floods, wetness, seepage, excess humus.	Severe: floods, wetness, seepage.	Poor: wetness, hard to pack, excess humus.
Charlton:					
CfB	Slight	Severe: seepage.	Severe: seepage.	Severe: seepage.	Fair: small stones.
CfC	Moderate: slope.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Fair: slope, small stones.

See footnote at end of table.

TABLE 9.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Charlton:					
CfD	Severe: slope.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage, slope.	Poor: slope.
ChB	Moderate: large stones.	Severe: seepage.	Severe: seepage.	Severe: seepage.	Fair: large stones, small stones.
ChC	Moderate: large stones, slope.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Fair: large stones, slope, small stones.
CnC	Severe: large stones.	Severe: seepage, slope.	Severe: seepage, large stones.	Severe: seepage.	Poor: large stones.
CnD	Severe: large stones, slope.	Severe: seepage, slope.	Severe: seepage, slope, large stones.	Severe: seepage, slope.	Poor: slope, large stones.
[1]CrC:					
Charlton part	Severe: large stones.	Severe: seepage, slope.	Severe: seepage, large stones.	Severe: seepage.	Poor: large stones.
Hollis part	Severe: depth to rock, large stones.	Severe: slope, depth to rock, seepage.	Severe: depth to rock, seepage, large stones.	Severe: seepage.	Poor: thin layer, area reclaim, large stones.
Cheshire:					
CsB	Slight	Severe: seepage.	Severe: seepage.	Severe: seepage.	Fair: small stones.
CsC	Moderate: slope.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Fair: slope, small stones.
CsD	Severe: slope.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage, slope.	Poor: slope.
CtB	Moderate: large stones.	Severe: seepage.	Severe: seepage.	Severe: seepage.	Fair: large stones, small stones.
CtC	Moderate: large stones, slope.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Fair: large stones, slope, small stones.
CvC	Severe: large stones.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Poor: large stones.
[1]CyC:					
Cheshire part	Moderate: large stones, slope.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Fair: large stones, slope, small stones.
Holyoke part	Severe: depth to rock.	Severe: slope, depth to rock, seepage.	Severe: depth to rock, seepage.	Severe: seepage.	Poor: thin layer, area reclaim.

See footnote at end of table.

TABLE 9.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Deerfield:					
De	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: thin layer, too sandy, area reclaim.
Dumps:					
Du.					
Ellington:					
Eh	Severe: wetness.	Severe: wetness, seepage.	Severe: wetness.	Severe: wetness.	Fair: thin layer, area reclaim.
Haven:					
HcA, HcB	Slight	Severe: seepage.	Severe: seepage.	Severe: seepage.	Fair: thin layer, area reclaim.
Hinckley:					
HkA, HkB	Slight	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: too sandy, thin layer.
HkC	Moderate: slope.	Severe: slope, seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: too sandy, thin layer.
[1]HME:					
Hinckley part	Severe: slope.	Severe: slope, seepage.	Severe: slope, seepage, too sandy.	Severe: slope, seepage.	Poor: slope, too sandy, thin layer.
Manchester part	Severe: slope.	Severe: slope, seepage.	Severe: slope, seepage, too sandy.	Severe: slope, seepage.	Poor: slope, thin layer, too sandy.
Hollis:					
[1]HpE:					
Hollis part	Severe: slope, depth to rock, large stones.	Severe: slope, depth to rock, seepage.	Severe: slope, depth to rock, seepage, large stones.	Severe: slope, seepage.	Poor: slope, thin layer, area reclaim, large stones.
Charlton part	Severe: large stones, slope.	Severe: seepage, slope.	Severe: seepage, slope, large stones.	Severe: seepage, slope.	Poor: slope, large stones.
[1]HrC:					
Hollis part	Severe: depth to rock, large stones.	Severe: slope, depth to rock, seepage.	Severe: depth to rock, seepage, large stones.	Severe: seepage.	Poor: thin layer, area reclaim, large stones.
Rock outcrop part.					
[1]HSE:					
Hollis part	Severe: slope, depth to rock, large stones.	Severe: slope, depth to rock, seepage.	Severe: slope, depth to rock, seepage, large stones.	Severe: slope, seepage.	Poor: slope, thin layer, area reclaim, large stones.

See footnote at end of table.

TABLE 9.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
[1]HSE:					
Rock outcrop part.					
Holyoke:					
HtC	Severe: depth to rock.	Severe: slope, depth to rock, seepage.	Severe: depth to rock, seepage.	Severe: seepage.	Poor: thin layer, area reclaim.
[1]HuD:					
Holyoke part	Severe: slope, depth to rock.	Severe: slope, depth to rock, seepage.	Severe: slope, depth to rock, seepage.	Severe: slope, seepage.	Poor: slope, thin layer, area reclaim.
Cheshire part	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: slope.
[1]HyC:					
Holyoke part	Severe: depth to rock.	Severe: slope, depth to rock, seepage.	Severe: depth to rock, seepage.	Severe: seepage.	Poor: thin layer, area reclaim.
Rock outcrop part.					
[1]HZE:					
Holyoke part	Severe: slope, depth to rock.	Severe: slope, depth to rock, seepage.	Severe: slope, depth to rock, seepage.	Severe: slope, seepage.	Poor: slope, thin layer, area reclaim.
Rock outcrop part.					
Leicester:					
Lc	Severe: wetness.	Severe: wetness, seepage.	Severe: wetness, seepage.	Severe: wetness, seepage.	Poor: wetness.
Ludlow:					
LpA	Severe: percs slowly, wetness.	Slight	Severe: wetness.	Severe: wetness.	Fair: area reclaim, small stones.
LpB	Severe: percs slowly, wetness.	Moderate: slope.	Severe: wetness.	Severe: wetness.	Fair: area reclaim, small stones.
LuB	Severe: percs slowly, wetness.	Moderate: slope, large stones.	Severe: wetness.	Severe: wetness.	Fair: large stones, area reclaim, small stones.
LvC	Severe: percs slowly, wetness, large stones.	Severe: slope.	Severe: large stones, wetness.	Severe: wetness.	Poor: large stones.
Manchester:					
MgA, MgB	Slight	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: thin layer, too sandy, area reclaim.

See footnote at end of table.

TABLE 9.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Manchester:					
MgC	Moderate: slope.	Severe: slope, seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: thin layer, too sandy, area reclaim.
Ninigret:					
Nn	Severe: wetness.	Severe: wetness, seepage.	Severe: wetness, seepage.	Severe: wetness, seepage.	Fair: thin layer, area reclaim.
Paxton:					
PbB	Severe: percs slowly.	Moderate: slope.	Slight	Slight	Fair: small stones.
PbC	Severe: percs slowly.	Severe: slope.	Slight	Moderate: slope.	Fair: small stones, slope.
PbD	Severe: slope, percs slowly	Severe: slope.	Moderate: slope.	Severe: slope.	Poor: slope.
PdB	Severe: percs slowly.	Moderate: slope.	Moderate: large stones.	Slight	Fair: large stones, small stones.
PdC	Severe: percs slowly.	Severe: slope.	Moderate: large stones.	Moderate: slope.	Fair: large stones, slope, small stones
PeC	Severe: percs slowly, large stones.	Severe: slope.	Severe: large stones.	Moderate: slope.	Poor: large stones.
PeD	Severe: slope, percs slowly, large stones.	Severe: slope.	Severe: slope, large stones.	Severe: slope.	Poor: slope, large stones.
Penwood:					
PnA, PnB	Slight	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: too sandy, area reclaim, thin layer.
Pits:					
Pr.					
Podunk:					
Ps	Severe: floods, wetness.	Severe: floods, wetness, seepage.	Severe: floods, wetness, seepage.	Severe: floods, wetness, seepage.	Fair: thin layer.
Podunk Variant:					
Pv	Severe: floods, wetness.	Severe: floods, wetness, seepage.	Severe: floods, wetness, seepage.	Severe: floods, wetness, seepage.	Fair: thin layer.
Quarries:					
Qu.					
Raynham:					
Ra	Severe: percs slowly, wetness.	Slight	Severe: wetness.	Severe: wetness.	Poor: wetness.

See footnote at end of table.

TABLE 9.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Raypol:					
Rb	Severe: wetness.	Severe: wetness, seepage.	Severe: wetness, seepage. too sandy.	Severe: wetness, seepage,	Poor: wetness.
Ridgebury:					
Rd	Severe: percs slowly, wetness.	Slight	Severe: wetness.	Severe: wetness.	Poor: wetness.
[1]RN:					
Ridgebury part	Severe: percs slowly, wetness, large stones.	Moderate: large stones.	Severe: wetness, large stones.	Severe: wetness.	Poor: wetness, large stones.
Leicester part	Severe: large stones, wetness.	Severe: wetness, seepage.	Severe: large stones, wetness, seepage.	Severe: wetness, seepage.	Poor: large stones, wetness.
Whitman part	Severe: wetness, percs slowly, large stones.	Moderate: large stones.	Severe: wetness, large stones.	Severe: wetness.	Poor: wetness, large stones.
Rock outcrop:					
[1]RP:					
Rock outcrop part.					
Hollis part	Severe: slope, depth to rock, large stones.	Severe: slope, depth to rock, seepage.	Severe: depth to rock, seepage, large stones.	Severe: slope, seepage.	Poor: slope, thin layer, area reclaim, large stones.
Rumney:					
Ru	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness, seepage.	Severe: floods, wetness, seepage.	Poor: wetness.
Rumney Variant:					
Rv	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness, seepage.	Severe: floods, wetness, seepage.	Poor: wetness.
Saco:					
Sc	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Poor: wetness.
Scarboro:					
Sr	Severe: wetness.	Severe: wetness.	Severe: wetness, seepage.	Severe: wetness.	Severe: wetness.
Scio:					
Ss	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Good.
Sutton:					
SvA, SvB	Severe: wetness.	Severe: wetness, seepage.	Severe: wetness, seepage.	Severe: wetness, seepage.	Fair: small stones.

See footnote at end of table.

TABLE 9.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Sutton:					
SxC	Severe: wetness, large stones.	Severe: slope, wetness, seepage.	Severe: wetness, seepage, large stones.	Severe: wetness, seepage.	Poor: large stones.
Urban land: Ur.					
Walpole:					
Wa	Severe: wetness.	Severe: wetness, seepage.	Severe: seepage, wetness.	Severe: seepage, wetness.	Poor: wetness.
Watchaug:					
WcA, WcB	Severe: wetness.	Severe: wetness, seepage.	Severe: wetness, seepage.	Severe: wetness, seepage.	Fair: small stones.
Westbrook:					
We, Wh	Severe: wetness, floods.	Severe: wetness, floods, excess humus.	Severe: wetness, floods, excess humus.	Severe: wetness, floods.	Poor: excess humus, wetness.
Wethersfield:					
WkB	Severe: percs slowly.	Moderate: slope.	Slight	Slight	Fair: small stones.
WkC	Severe: percs slowly.	Severe: slope.	Slight	Moderate: slope.	Fair: small stones, slope.
WkD	Severe: slope, percs slowly.	Severe: slope.	Moderate: slope.	Severe: slope.	Poor: slope.
WmB	Severe: percs slowly.	Moderate: slope.	Moderate: large stones.	Slight	Fair: large stones, small stones.
WmC	Severe: percs slowly.	Severe: slope.	Moderate: large stones.	Moderate: slope.	Fair: large stones, small stones, slope.
WnC	Severe: percs slowly, large stones.	Severe: slope.	Severe: large stones.	Moderate: slope.	Poor: large stones.
WnD	Severe: slope, percs slowly, large stones.	Severe: slope.	Severe: slope, large stones.	Severe: slope.	Poor: slope, large stones.
Wilbraham:					
Wr	Severe: percs slowly, wetness.	Slight	Severe: wetness.	Severe: wetness.	Poor: wetness.
Ws	Severe: wetness, percs slowly.	Slight	Severe: wetness.	Severe: wetness.	Poor: wetness.

See footnote at end of table.

TABLE 9.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Wilbraham:					
[1]WT:					
Wilbraham part	Severe: wetness, percs slowly, large stones.	Moderate: large stones.	Severe: wetness, large stones.	Severe: wetness.	Poor: wetness, large stones.
Menlo part	Severe: wetness, percs slowly, large stones.	Moderate: large stones.	Severe: wetness, large stones.	Severe: wetness.	Poor: wetness, large stones.
Woodbridge:					
WxA, WxB	Severe: percs slowly, wetness.	Moderate: large stones.	Severe: wetness.	Severe: wetness.	Fair: small stones.
WyB	Severe: percs slowly, wetness.	Moderate: large stones.	Severe: wetness.	Severe: wetness.	Fair: large stones, small stones.
WzC	Severe: percs slowly, wetness.	Severe: slope.	Severe: wetness, large stones.	Severe: wetness.	Poor: large stones.
Yalesville:					
YaB	Severe: depth to rock.	Severe: depth to rock, seepage.	Severe: depth to rock.	Severe: seepage.	Fair: thin layer, area reclaim.
YaC	Severe: depth to rock.	Severe: slope, depth to rock, seepage.	Severe: depth to rock.	Severe: seepage.	Fair: slope, thin layer, area reclaim.

[1]This map unit is made up of two or more dominant kinds of soil. See the map unit description for the composition and behavior characteristics of the map unit.

TABLE 10.--CONSTRUCTION MATERIALS

[Some of the terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," and "poor." Absence of an entry means that the soil was not rated]

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
Adrian:				
[1]AA:				
Adrian part	Poor: excess humus, wetness.	Poor: excess humus.	Poor: excess humus.	Poor: wetness, excess humus.
Palms part	Poor: wetness, excess humus.	Unsuited: excess fines, excess humus.	Unsuited: excess humus, excess fines.	Poor: wetness, excess humus.
Agawam:				
AfA, AfB	Good	Good	Good	Fair: area reclaim.
AfC	Good	Good	Good	Fair: slope, area reclaim.
Beaches:				
Ba.				
Branford:				
BoA, BoB	Good	Good	Good	Fair: area reclaim.
BoC	Good	Good	Good	Fair: slope, area reclaim.
[1]BrC:				
Branford part	Good	Good	Good	Fair: slope, area reclaim.
Holyoke part	Poor: thin layer, area reclaim.	Unsuited: excess fines, thin layer.	Unsuited: excess fines, thin layer.	Poor: thin layer, area reclaim.
Carlisle:				
Ce	Poor: frost action, low strength, excess humus.	Unsuited: excess humus.	Unsuited: excess humus.	Poor: wetness, excess humus.
Charlton:				
CfB	Good	Unsuited: excess fines.	Poor: excess fines.	Fair: small stones.
CfC	Good	Unsuited: excess fines.	Poor: excess fines.	Fair: small stones, slope.
CfD	Fair: slope.	Unsuited: excess fines.	Poor: excess fines.	Poor: slope.
ChB, ChC	Good	Unsuited: excess fines.	Poor: excess fines.	Poor: large stones.
CnC	Fair: large stones.	Unsuited: excess fines.	Poor: excess fines.	Poor: large stones.
CnD	Poor: slope.	Unsuited: excess fines.	Poor: excess fines.	Poor: large stones, slope.

See footnote at end of table.

TABLE 10.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
Charlton:				
[1]CrC:				
Charlton part	Fair: large stones.	Unsuited: excess fines.	Poor: excess fines.	Poor: large stones.
Hollis part	Poor: thin layer, area reclaim.	Unsuited: excess fines, thin layer.	Unsuited: thin layer, excess fines.	Poor: thin layer, area reclaim, large stones.
Cheshire:				
CsB, CsC	Good	Unsuited: excess fines.	Poor: excess fines.	Fair: small stones.
CsD	Fair: slope.	Unsuited: excess fines.	Poor: excess fines.	Poor: slope.
CtB, CtC	Good	Unsuited: excess fines.	Poor: excess fines.	Poor: large stones.
CvC	Fair: large stones.	Unsuited: excess fines.	Poor: excess fines.	Poor: large stones.
[1]CyC:				
Cheshire part	Good	Unsuited: excess fines.	Poor: excess fines.	Poor: large stones.
Holyoke part	Poor: thin layer, area reclaim.	Unsuited: excess fines, thin layer.	Unsuited: thin layer, excess fines.	Poor: thin layer, area reclaim, large stones.
Deerfield:				
De	Good	Good	Unsuited: excess fines.	Poor: too sandy.
Dumps:				
Du.				
Ellington:				
Eh	Good	Good	Good	Fair: area reclaim.
Haven:				
HcA, HcB	Good	Good	Good	Fair: area reclaim.
Hinckley:				
HkA, HkB, HkC	Good	Good	Good	Poor: too sandy.
[1]HME:				
Hinckley part	Poor: slope.	Good	Good	Poor: slope, too sandy.
Manchester part	Poor: slope.	Good	Good	Poor: slope, too sandy.
Hollis:				
[1]HpE:				
Hollis part	Poor: slope, thin layer, area reclaim.	Unsuited: excess fines, thin layer.	Unsuited: thin layer, excess fines.	Poor: slope, thin layer, area reclaim, large stones.

See footnote at end of table.

TABLE 10.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
Hollis:				
Charlton part	Poor: slope.	Unsuited: excess fines.	Poor: excess fines.	Poor: large stones, slope.
[1]HrC:				
Hollis part	Poor: thin layer, area reclaim.	Unsuited: excess fines, thin layer.	Unsuited: thin layer, excess fines.	Poor: thin layer, area reclaim, large stones.
Rock outcrop part.				
[1]HSE:				
Hollis part	Poor: slope, thin layer, area reclaim.	Unsuited: excess fines, thin layer.	Unsuited: thin layer, excess fines.	Poor: slope, thin layer, area reclaim, large stones.
Rock outcrop part.				
Holyoke:				
HtC	Poor: thin layer, area reclaim.	Unsuited: excess fines, thin layer.	Unsuited: thin layer, excess fines.	Poor: thin layer, area reclaim, large stones.
[1]HuD:				
Holyoke part	Poor: slope, thin layer, area reclaim.	Unsuited: excess fines, thin layer.	Unsuited: thin layer, excess fines.	Poor: slope, thin layer, area reclaim, large stones.
Cheshire part	Poor: slope.	Unsuited: excess fines.	Poor: excess fines.	Poor: large stones, slope.
[1]HyC:				
Holyoke part	Poor: thin layer, area reclaim.	Unsuited: excess fines, thin layer.	Unsuited: thin layer, excess fines.	Poor: thin layer, area reclaim, large stones.
Rock outcrop part.				
[1]HZE:				
Holyoke part	Poor: slope, thin layer, area reclaim.	Unsuited: excess fines, thin layer.	Unsuited: thin layer, excess fines.	Poor: slope, thin layer, area reclaim, large stones.
Rock outcrop part.				
Leicester:				
Lc	Poor: wetness.	Unsuited: excess fines.	Poor: excess fines.	Poor: wetness.
Ludlow:				
LpA, LpB	Poor: frost action.	Unsuited: excess fines.	Poor: excess fines.	Fair: small stones.
LuB, LvC	Poor: frost action.	Unsuited: excess fines.	Poor: excess fines.	Poor: large stones.
Manchester:				
MgA, MgB, MgC	Good	Good	Good	Poor: too sandy.

See footnote at end of table.

TABLE 10.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
Ninigret:				
Nn	Good	Good	Good	Fair: area reclaim.
Paxton:				
PbB, PbC	Fair: frost action.	Unsuited: excess fines.	Poor: excess fines.	Fair: small stones.
PbD	Fair: frost action, slope.	Unsuited: excess fines.	Poor: excess fines.	Poor: slope.
PdB, PdC	Fair: frost action.	Unsuited: excess fines.	Poor: excess fines.	Poor: large stones.
PeC	Fair: frost action, large stones.	Unsuited; excess fines.	Poor: excess fines.	Poor: large stones.
PeD	Poor: slope.	Unsuited: excess fines.	Poor: excess fines.	Poor: slope, large stones.
Penwood:				
PnA, PnB	Good	Good	Poor: excess fines.	Poor: too sandy.
Pits:				
Pr.				
Podunk:				
Ps	Good	Fair: excess fines.	Poor: excess fines.	Good.
Podunk Variant:				
Pv	Fair: frost action.	Fair: excess fines.	Poor: excess fines.	Good.
Quarries:				
Qu.				
Raynham:				
Ra	Poor: frost action, wetness.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: wetness.
Raypol:				
Rb	Poor: wetness, frost action.	Fair: excess fines.	Fair: excess fines.	Poor: wetness.
Ridgebury:				
Rd	Poor: frost action, wetness.	Unsuited: excess fines.	Poor: excess fines.	Poor: wetness.
[1]RN:				
Ridgebury part	Poor: wetness, frost action.	Unsuited: excess fines.	Poor: excess fines.	Poor: wetness, large stones.
Leicester part	Poor: wetness, frost action.	Unsuited: excess fines.	Poor: excess fines.	Poor: wetness, large stones.
Whitman part	Poor: wetness, frost action.	Unsuited: excess fines.	Poor: excess fines.	Poor: wetness, large stones.

See footnote at end of table.

TABLE 10.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
Rock outcrop:				
[1]RP:				
Rock outcrop part.				
Hollis part	Poor: thin layer, area reclaim, slope.	Unsuited excess fines, thin layer.	Unsuited: thin layer, excess fines.	Poor: slope, thin layer, area reclaim, large stones.
Rumney:				
Ru	Poor: wetness.	Poor: excess fines.	Poor: excess fines.	Poor: wetness.
Rumney Variant:				
Rv	Poor: wetness, frost action.	Poor: excess fines.	Poor: excess fines.	Poor: wetness.
Saco:				
Sc	Poor: wetness, frost action.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: wetness.
Scarboro:				
Sr	Poor: wetness.	Good	Poor: excess fines.	Poor: wetness, too sandy.
Scio:				
Ss	Poor: frost action.	Poor: excess fines.	Poor: excess fines.	Good.
Sutton:				
SvA, SvB	Good	Unsuited: excess fines.	Poor: excess fines.	Fair: small stones.
SxC	Fair: large stones.	Unsuited: excess fines.	Poor: excess fines.	Poor: large stones.
Urban land:				
Ur.				
Walpole:				
Wa	Poor: wetness.	Good	Fair: excess fines.	Poor: wetness.
Watchaug:				
WcA, WcB	Good	Unsuited: excess fines.	Poor: excess fines.	Fair: small stones.
Westbrook:				
We, Wh	Poor: excess humus, wetness.	Unsuited: excess humus.	Poor: excess humus.	Poor: wetness, excess salt, excess humus.
Wethersfield:				
WkB	Fair: frost action.	Unsuited: excess fines.	Poor: excess fines.	Fair: small stones.
WkC	Fair: frost action.	Unsuited: excess fines.	Poor: excess fines.	Fair: slope, small stones.
WkD	Fair: slope, frost action.	Unsuited: excess fines.	Poor: excess fines.	Poor: slope.

See footnote at end of table.

TABLE 10.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
Wethersfield:				
WmB, WmC	Fair: frost action.	Unsuited: excess fines.	Poor: excess fines.	Poor: large stones.
WnC	Fair: frost action, large stones.	Unsuited: excess fines.	Poor: excess fines.	Poor: large stones.
WnD	Poor: slope.	Unsuited: excess fines.	Poor: excess fines.	Poor: slope, large stones.
Wilbraham:				
Wr	Poor: frost action, wetness.	Unsuited: excess fines.	Poor: excess fines.	Poor: wetness.
Ws	Poor: wetness, frost action.	Unsuited: excess fines.	Poor: excess fines.	Poor: wetness, large stones.
[1]WT:				
Wilbraham part	Poor: wetness, frost action.	Unsuited: excess fines.	Poor: excess fines.	Poor: wetness, large stones.
Menlo part	Poor: wetness, frost action.	Unsuited: excess fines.	Poor: excess fines.	Poor: wetness, large stones.
Woodbridge:				
WxA, WxB	Fair: frost action.	Unsuited	Poor: excess fines.	Fair: small stones.
WyB, WzC	Fair: frost action.	Unsuited: excess fines.	Poor: excess fines.	Poor: large stones.
Yalesville:				
YaB	Poor: thin layer, area reclaim.	Unsuited: excess fines, thin layer.	Unsuited: excess fines.	Fair: small stones.
YaC	Poor: thin layer, area reclaim.	Unsuited: excess fines, thin layer.	Unsuited: excess fines.	Fair: slope, small stones.

[1]This map unit is made up of two or more dominant kinds of soil. See the map unit description for the composition and behavior characteristics of the map unit.

TABLE 11.--WATER MANAGEMENT

["Seepage" and other terms that describe restrictive soil features are defined in the Glossary. Absence of an entry means that the soil was not evaluated]

Soil name and map symbol	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Terraces and diversions	Grassed waterways
Adrian:						
[1]AA:						
Adrian part	Seepage	Compressible, seepage, hard to pack.	Favorable	Wetness, cutbanks cave, excess humus.	Not needed	Not needed.
Palms part	Seepage	Compressible, hard to pack, low strength.	Favorable	Wetness, cutbanks cave, excess humus.	Not needed	Not needed.
Agawam:						
AfA, AfB, AfC	Seepage, slope.	Seepage, piping.	No water	Not needed	Slope	Slope, erodes easily.
Beaches:						
Ba.						
Branford:						
BoA, BoB, BoC	Seepage, slope.	Seepage, piping.	No water	Not needed	Slope	Slope, erodes easily.
[1]BrC:						
Branford part	Seepage, slope.	Seepage, piping.	No water	Not needed	Slope	Slope, erodes easily.
Holyoke part	Slope, depth to rock, seepage.	Thin layer, piping, seepage.	No water, depth to rock.	Not needed	Slope, depth to rock.	Slope, droughty, rooting depth.
Carlisle:						
Ce	Seepage	Low strength, compressible, hard to pack.	Favorable	Wetness, cutbanks cave, excess humus.	Not needed	Not needed.
Charlton:						
CfB, CfC, CfD	Seepage, slope.	Seepage	No water	Not needed	Slope	Slope.
ChB, ChC, CnC, CnD	Seepage, slope.	Seepage, large stones.	No water	Not needed	Large stones, slope.	Large stones, slope.
[1]CrC:						
Charlton part	Seepage, slope.	Seepage, large stones.	No water	Not needed	Large stones, slope.	Large stones, slope.
Hollis part	Slope, depth to rock, seepage.	Thin layer, seepage.	No water, depth to rock.	Not needed	Slope, depth to rock, large stones.	Slope, droughty, depth to rock, large stones.
Cheshire:						
CsB, CsC, CsD	Seepage, slope.	Seepage	No water	Not needed	Slope	Slope.
CtB, CtC, CvC	Seepage, slope.	Seepage, large stones.	No water	Not needed	Large stones, slope.	Large stones, slope.
[1]CyC:						
Cheshire part	Seepage, slope.	Seepage, large stones.	No water	Not needed	Large stones, slope.	Large stones, slope.

See footnote at end of table.

TABLE 11.--WATER MANAGEMENT--Continued

Soil name and map symbol	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Terraces and diversions	Grassed waterways
[1]CyC:						
Holyoke part	Slope, depth to rock, seepage.	Thin layer, piping, seepage.	No water, depth to rock.	Not needed	Slope, depth to rock.	Slope, droughty.
Deerfield:						
De	Slope, seepage.	Seepage, piping.	Deep to water, cutbanks cave.	Slope, cutbanks cave.	Slope, too sandy.	Slope.
Dumps:						
Du.						
Ellington:						
Eh	Slope, seepage.	Seepage, piping.	Deep to water, cutbanks cave.	Slope, cutbanks cave.	Seepage, slope.	Slope, erodes easily, seepage.
Haven:						
HcA, HcB	Seepage, slope.	Seepage, piping.	No water	Not needed	Slope, erodes easily.	Slope, erodes easily.
Hinckley:						
HkA, HkB, HkC	Slope, seepage.	Thin layer, seepage.	No water	Not needed	Slope, too sandy.	Slope, droughty.
[1]HME:						
Hinckley part	Slope, seepage.	Thin layer, seepage.	No water	Not needed	Slope, too sandy.	Slope, droughty.
Manchester part	Slope, seepage.	Seepage, thin layer.	No water	Not needed	Slope, too sandy.	Slope, droughty.
Hollis:						
[1]HpE:						
Hollis part	Slope, depth to rock, seepage.	Thin layer, seepage.	No water, depth to rock.	Not needed	Slope, depth to rock, large stones.	Slope, droughty, large stones.
Charlton part	Seepage, slope.	Seepage, large stones.	No water	Not needed	Large stones, slope.	Large stones, slope.
[1]HrC:						
Hollis part	Slope, depth to rock, seepage.	Thin layer, seepage.	No water, depth to rock.	Not needed	Slope, depth to rock, large stones.	Slope, droughty, large stones.
Rock outcrop part.						
[1]HSE:						
Hollis part	Slope, depth to rock, seepage.	Thin layer, seepage.	No water, depth to rock.	Not needed	Slope, depth to rock, large stones.	Slope, droughty, large stones.
Rock outcrop part.						
Holyoke:						
HtC	Slope, depth to rock, seepage.	Thin layer, piping, seepage.	No water, depth to rock.	Not needed	Slope, depth to rock.	Slope, droughty.
[1]HuD:						
Holyoke part	Slope, depth to rock, seepage.	Thin layer, piping, seepage.	No water, depth to rock.	Not needed	Slope, depth to rock.	Slope, droughty.
Cheshire part	Seepage, slope.	Seepage, large stones.	No water	Not needed	Large stones, slope.	Large stones, slope.

See footnote at end of table.

TABLE 11.--WATER MANAGEMENT--Continued

Soil name and map symbol	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Terraces and diversions	Grassed waterways
[1]HyC:						
Holyoke part	Slope, depth to rock, seepage.	Thin layer, piping, seepage.	No water, depth to rock.	Not needed	Slope, depth to rock.	Slope, droughty.
Holyoke:						
Rock outcrop part.						
[1]HZE:						
Holyoke part	Slope, depth to rock, seepage.	Thin layer, piping, seepage.	No water, depth to rock.	Not needed	Slope, depth to rock.	Slope, droughty.
Rock outcrop part.						
Leicester:						
Lc	Seepage, slope.	Seepage	Favorable	Wetness	Wetness	Wetness.
Ludlow:						
LpA, LpB	Slope	Favorable	Deep to water	Percs slowly, slope.	Percs slowly, slope.	Percs slowly, slope.
LuB, LvC	Slope	Large stones	Deep to water, large stones.	Percs slowly, slope, large stones.	Percs slowly, slope, large stones.	Percs slowly, slope, large stones.
Manchester:						
MgA, MgB, MgC	Slope, seepage.	Seepage, thin layer.	No water	Not needed	Slope, too sandy, complex slope.	Slope, droughty.
Ninigret:						
Nn	Slope, seepage.	Seepage	Deep to water, cutbanks cave.	Wetness, slope, cutbanks cave.	Slope, wetness.	Slope, wetness.
Paxton:						
PbB, PbC, PbD	Slope	Favorable	No water	Not needed	Percs slowly	Percs slowly, slope, erodes easily.
PdB, PdC, PeC, PeD	Slope	Large stones	No water	Not needed	Large stones, percs slowly.	Large stones, percs slowly.
Penwood:						
PnA, PnB	Seepage, slope.	Seepage, piping.	No water, cutbanks cave.	Not needed	Too sandy, slope.	Droughty, slope.
Pits:						
Pr.						
Podunk:						
Ps	Floods, seepage.	Seepage	Floods, deep to water.	Floods	Not needed	Not needed.
Podunk Variant:						
Pv	Floods, seepage.	Piping, seepage.	Floods, deep to water.	Floods	Not needed	Wetness.
Quarries:						
Qu.						
Raynham:						
Ra	Seepage	Piping, low strength, erodes easily.	Favorable	Wetness, percs slowly.	Wetness, percs slowly, erodes easily.	Wetness, percs slowly, erodes easily.

See footnote at end of table.

TABLE 11.--WATER MANAGEMENT--Continued

Soil name and map symbol	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Terraces and diversions	Grassed waterways
Raypol:						
Rb	Seepage	Piping, seepage.	Favorable	Wetness	Wetness, erodes easily.	Wetness, erodes easily.
Ridgebury:						
Rd	Slope	Favorable	Favorable	Wetness, percs slowly.	Wetness, percs slowly.	Wetness, percs slowly.
[1]RN:						
Ridgebury part	Slope	Large stones	Large stones	Wetness, percs slowly.	Wetness, large stones, percs slowly.	Wetness, large stones, percs slowly.
Leicester part	Seepage, slope.	Seepage, large stones.	Large stones	Wetness	Wetness, large stones.	Wetness, large stones.
Whitman part	Favorable	Large stones	Large stones	Wetness, percs slowly.	Large stones, wetness, percs slowly.	Large stones, wetness, percs slowly.
Rock outcrop:						
[1]RP:						
Rock outcrop part.						
Hollis part	Slope, depth to rock, seepage.	Thin layer, seepage.	No water, depth to rock.	Not needed	Slope, depth to rock, large stones.	Slope, droughty, large stones.
Rumney:						
Ru	Floods, seepage.	Seepage	Floods	Wetness, floods.	Not needed	Wetness.
Rumney Variant:						
Rv	Floods, seepage.	Piping, seepage.	Floods	Floods, wetness.	Not needed	Wetness.
Saco:						
Sc	Floods	Low strength, piping.	Floods	Wetness, floods.	Not needed	Wetness.
Scarboro:						
Sr	Seepage	Hard to pack, seepage.	Favorable	Cutbanks cave, wetness.	Not needed	Wetness.
Scio:						
Ss	Seepage, slope.	Low strength, piping.	Deep to water	Cutbanks cave	Slope, erodes easily.	Slope, erodes easily.
Sutton:						
SvA, SvB	Slope, seepage.	Seepage	Deep to water	Wetness	Slope, wetness.	Slope, wetness.
SxC	Slope, seepage.	Large stones, seepage.	Deep to water, large stones.	Wetness	Slope, large stones, wetness.	Slope, wetness, large stones.
Urban land:						
Ur.						
Walpole:						
Wa	Seepage	Hard to pack, seepage.	Favorable	Wetness	Wetness	Wetness.
Watchaug:						
WcA, WcB	Slope, seepage.	Seepage	Deep to water	Wetness	Slope, wetness.	Slope, wetness.

See footnote at end of table.

TABLE 11.--WATER MANAGEMENT--Continued

Soil name and map symbol	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Terraces and diversions	Grassed waterways
Westbrook:						
We, Wh	Excess humus, seepage. floods.	Hard to pack, excess humus, seepage.	Salty water, floods.	Floods, wetness, excess salt.	Not needed	Not needed.
Wethersfield:						
WkB, WkC, WkD	Slope	Favorable	No water	Not needed	Slope, percs slowly.	Slope, percs slowly, erodes easily.
WmB, WmC, WnC, WnD	Slope, large stones.	Large stones	No water	Not needed	Slope, large stones, percs slowly.	Slope, large stones, percs slowly.
Wilbraham:						
Wr	Slope	Favorable	Favorable	Wetness, percs slowly.	Wetness, percs slowly.	Wetness, percs slowly.
Ws	Slope	Large stones	Large stones	Wetness, percs slowly.	Wetness, large stones, percs slowly.	Wetness, large stones, percs slowly.
[1]WT:						
Wilbraham part	Slope	Large stones	Large stones	Wetness, percs slowly.	Wetness, large stones, percs slowly.	Wetness, large stones, percs slowly.
Menlo part	Favorable	Large stones	Large stones	Wetness, percs slowly.	Large stones, wetness, percs slowly.	Large stones, wetness, percs slowly.
Woodbridge:						
WxA, WxB	Slope	Favorable	Deep to water	Percs slowly, slope.	Percs slowly, slope.	Percs slowly, slope.
WyB, WzC	Slope, large stones.	Large stones	Deep to water, large stones.	Percs slowly, slope, large stones.	Percs slowly, slope, large stones.	Percs slowly, slope, large stones.
Yalesville:						
YaB, YaC	Seepage, depth to rock, slope.	Seepage, thin layer.	No water	Not needed	Depth to rock, slope.	Slope, rooting depth.

[1]This map unit is made up of two or more dominant kinds of soil. See the map unit description for the composition and behavior characteristics of the map unit.

TABLE 12.--RECREATIONAL DEVELOPMENT

["Percs slowly" and other terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
Adrian:					
[1]AA:					
Adrian part	Severe: wetness, excess humus.	Severe: wetness, excess humus.	Severe: wetness, excess humus.	Severe: wetness, excess humus.	Severe: excess humus, wetness.
Palms part	Severe: wetness, excess humus.	Severe: wetness, excess humus.	Severe: wetness, excess humus.	Severe: wetness, excess humus.	Severe: wetness, excess humus.
Agawam:					
AfA	Slight	Slight	Slight	Slight	Slight.
AfB	Slight	Slight	Moderate: slope.	Slight	Slight.
AfC	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
Beaches:					
Ba.					
Branford:					
BoA	Slight	Slight	Slight	Slight	Slight.
BoB	Slight	Slight	Moderate: slope.	Slight	Slight.
BoC	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
[1]BrC:					
Branford part	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
Holyoke part	Moderate: slope.	Moderate: slope.	Severe: slope, depth to rock.	Slight	Severe: depth to rock.
Carlisle:					
Ce	Severe: wetness, excess humus.	Severe: wetness, excess humus.	Severe: wetness, excess humus.	Severe: wetness, excess humus.	Severe: excess humus, wetness.
Charlton:					
CfB	Slight	Slight	Moderate: slope.	Slight	Slight.
CfC	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
CfD	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
ChB	Moderate: large stones.	Slight	Moderate: large stones, slope.	Moderate: large stones.	Moderate: large stones.

See footnote at end of table.

TABLE 12.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
Charlton:					
ChC	Moderate: large stones, slope.	Moderate: slope.	Severe: slope.	Moderate: large stones.	Moderate: large stones, slope.
CnC	Severe: large stones.	Severe: large stones.	Severe: slope, large stones.	Severe: large stones.	Severe: large stones.
CnD	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.
[1]CrC:					
Charlton part	Severe: large stones.	Severe: large stones.	Severe: slope, large stones.	Severe: large stones.	Severe: large stones.
Hollis part	Severe: large stones.	Severe: large stones.	Severe: slope, depth to rock, large stones.	Severe: large stones.	Severe: depth to rock, large stones.
Cheshire:					
CsB	Slight	Slight	Moderate: slope.	Slight	Slight.
CsC	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
CsD	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
CtB	Moderate: large stones.	Slight	Moderate: large stones, slope.	Moderate: large stones.	Moderate: large stones.
CtC	Moderate: large stones, slopes.	Moderate: slope.	Severe: slope.	Moderate: large stones.	Moderate: large stones, slope.
CvC	Severe: large stones.	Severe: large stones.	Severe: large stones, slope.	Severe: large stones.	Severe: large stones.
[1]CyC:					
Cheshire part	Moderate: large stones, slope.	Moderate: slope.	Severe: slope.	Moderate: large stones.	Moderate: large stones, slope.
Holyoke part	Moderate: slope, large stones.	Moderate: slope.	Severe: slope, depth to rock.	Moderate: large stones.	Severe: depth to rock.
Deerfield:					
De	Moderate: too sandy.	Moderate: too sandy.	Moderate: wetness, too sandy.	Moderate: too sandy.	Severe: too sandy.
Dumps:					
Du.					
Ellington:					
Eh	Moderate: wetness.	Slight	Moderate: wetness.	Slight	Slight.
Haven:					
HcA	Slight	Slight	Slight	Slight	Slight.
HcB	Slight	Slight	Moderate: slope.	Slight	Slight.

See footnote at end of table.

TABLE 12.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
Hinckley:					
HkA, HkB	Moderate: small stones.	Moderate: small stones.	Severe: small stones.	Moderate: small stones.	Severe: small stones, droughty.
HkC	Moderate: small stones, slope.	Moderate: small stones, slope.	Severe: slope, small stones.	Moderate: small stones.	Severe: small stones, droughty.
[1]HME:					
Hinckley part	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope, small stones, droughty.
Manchester part	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope, small stones, droughty.
Hollis:					
[1]HpE:					
Hollis part	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, depth to rock, large stones.	Severe: slope, large stones.	Severe: slope, depth to rock, large stones.
Charlton part	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.
[1]HrC:					
Hollis part	Severe: large stones.	Severe: large stones.	Severe: slope, depth to rock, large stones.	Severe: large stones.	Severe: depth to rock, large stones.
Rock outcrop part.					
[1]HSE:					
Hollis part	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, depth to rock, large stones.	Severe: slope, large stones.	Severe: slope, depth to rock, large stones.
Rock outcrop part.					
Holyoke:					
HtC	Moderate: slope, large stones.	Moderate: slope.	Severe: slope, depth to rock, large stones.	Moderate: large stones, slope.	Severe: depth to rock.
[1]HuD:					
Holyoke part	Severe: slope.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.
Cheshire part	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
[1]HyC:					
Holyoke part	Moderate: slope, large stones.	Moderate: slope.	Severe: slope, depth to rock.	Moderate: slope, large stones.	Severe: depth to rock.
Rock outcrop part.					

See footnote at end of table.

TABLE 12.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
[1]HZE:					
Holyoke part	Severe: slope.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.
Rock outcrop part.					
Leicester:					
Lc	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Ludlow:					
LpA	Moderate: percs slowly, wetness.	Slight	Moderate: percs slowly, wetness.	Slight	Slight.
LpB	Moderate: percs slowly, wetness.	Slight	Moderate: slope, percs slowly, wetness.	Slight	Slight.
LuB	Moderate: large stones, percs slowly, wetness.	Slight	Moderate: slope, percs slowly, large stones, wetness.	Moderate: large stones.	Moderate: large stones.
LvC	Severe: large stones.	Severe: large stones.	Severe: slope, large stones.	Severe: large stones.	Severe: large stones.
Manchester:					
MgA, MgB	Moderate: small stones.	Moderate: small stones.	Severe: small stones.	Moderate: small stones.	Severe: small stones, droughty.
MgC	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Moderate: small stones.	Severe: small stones, droughty.
Ninigret:					
Nn	Moderate: wetness.	Slight	Moderate: wetness.	Slight	Slight.
Paxton:					
PbB	Moderate: percs slowly.	Slight	Moderate: percs slowly, slope.	Slight	Slight.
PbC	Moderate: percs slowly, slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
PbD	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
PdB	Moderate: percs slowly, large stones.	Slight	Moderate: percs slowly, large stones.	Moderate: large stones.	Moderate: large stones.
PdC	Moderate: percs slowly, large stones.	Moderate: slope.	Severe: slope.	Moderate: large stones.	Moderate: large stones, slope.
PeC	Severe: large stones.	Severe: large stones.	Severe: slope, large stones.	Severe: large stones.	Severe: large stones.

See footnote at end of table.

TABLE 12.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
Paxton:					
PeD	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.
Penwood:					
PnA, PnB	Moderate: too sandy.	Moderate: too sandy.	Severe: too sandy.	Moderate: too sandy.	Severe: too sandy, droughty.
Pits:					
Pr.					
Podunk:					
Ps	Severe: floods.	Severe: floods.	Severe: floods.	Moderate: floods.	Severe: floods.
Podunk Variant:					
Pv	Severe: floods.	Moderate: floods.	Severe: floods.	Moderate: floods.	Severe: floods.
Quarries:					
Qu.					
Raynham:					
Ra	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Raypol:					
Rb	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Ridgebury:					
Rd	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
[1]RN:					
Ridgebury part	Severe: wetness, large stones.	Severe: wetness, large stones.	Severe: wetness, large stones.	Severe: wetness, large stones.	Severe: wetness, large stones.
Leicester part	Severe: large stones, wetness.	Severe: large stones, wetness.	Severe: large stones, wetness.	Severe: large stones, wetness.	Severe: wetness, large stones.
Whitman part	Severe: large stones, wetness.	Severe: wetness, large stones.	Severe: large stones, wetness.	Severe: wetness, large stones.	Severe: wetness, large stones.
Rock outcrop:					
[1]RP:					
Rock outcrop part.					
Hollis part	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, depth to rock, large stones.	Moderate: slope, large stones.	Severe: slope, depth to rock, large stones.
Rumney:					
Ru	Severe: floods, wetness.	Severe: wetness.	Severe: floods, wetness.	Severe: wetness, floods.	Severe: floods, wetness.
Rumney Variant:					
Rv	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.	Severe: floods, wetness.

See footnote at end of table.

TABLE 12.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
Saco:					
Sc	Severe: floods, wetness.	Severe: wetness, floods.	Severe: floods, wetness.	Severe: wetness, floods.	Severe: floods, wetness.
Scarboro:					
Sr	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Scio:					
Ss	Moderate: wetness.	Slight	Moderate: wetness.	Slight	Slight.
Sutton:					
SvA	Moderate: wetness.	Slight	Moderate: wetness.	Slight	Slight.
SvB	Moderate: wetness.	Slight	Moderate: slope, wetness.	Slight	Slight.
SxC	Severe: large stones, slope.	Moderate: large stones, slope.	Severe: large stones, slope.	Severe: large stones.	Severe: large stones.
Urban land: Ur.					
Walpole:					
Wa	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Watchaug:					
WcA	Moderate: wetness.	Slight	Moderate: wetness.	Slight	Slight.
WcB	Moderate: wetness.	Slight	Moderate: slope, wetness.	Slight	Slight.
Westbrook:					
We, Wh	Severe: wetness, floods, excess humus.	Severe: wetness, floods, excess humus.	Severe: wetness, floods, excess humus.	Severe: wetness, floods, excess humus.	Severe: wetness, floods, excess salt.
Wethersfield:					
WkB	Moderate: percs slowly.	Slight	Moderate: slope, percs slowly.	Slight	Slight.
WkC	Moderate: slope, percs slowly.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
WkD	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
WmB	Moderate: percs slowly, large stones.	Slight	Moderate: slope, percs slowly, large stones.	Moderate: large stones.	Moderate: large stones.
WmC	Moderate: slope, percs slowly, large stones.	Moderate: slope.	Severe: slope.	Moderate: large stones.	Moderate: slope, large stones.

See footnote at end of table.

TABLE 12.--RECREATIONAL DEVELOPMENT--*Continued*

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
Wethersfield:					
WnC	Severe: large stones.	Severe: large stones.	Severe: slope, large stones.	Severe: large stones.	Severe: large stones.
WnD	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.
Wilbraham:					
Wr, Ws	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
[1]WT:					
Wilbraham part	Severe: wetness, large stones.	Severe: wetness, large stones.	Severe: wetness, large stones.	Severe: wetness, large stones.	Severe: wetness, large stones.
Menlo part	Severe: wetness, large stones.	Severe: wetness, large stones.	Severe: wetness, large stones.	Severe: wetness, large stones.	Severe: wetness, large stones.
Woodbridge:					
WxA, WxB	Moderate: percs slowly, wetness.	Slight	Moderate: percs slowly, wetness.	Severe: slope.	Slight.
WyB	Moderate: percs slowly, wetness, large stones.	Slight	Moderate: percs slowly, wetness, large stones, slope.	Moderate: large stones.	Moderate: large stones.
WzC	Severe: large stones.	Severe: large stones.	Severe: slope, large stones.	Severe: large stones.	Severe: large stones.
Yalesville:					
YaB	Slight	Slight	Moderate: slope, depth to rock.	Slight	Moderate: depth to rock.
YaC	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope, depth to rock.

[1]This map unit is made up of two or more dominant kinds of soil. See the map unit description for the composition and behavior characteristics of the map unit.

TABLE 13.--WILDLIFE HABITAT POTENTIALS

[See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
Adrian:										
[1]AA:										
Adrian part.	Very poor.	Very poor.	Very poor.	Poor	Poor	Good	Good	Very poor.	Poor	Good.
Palms part.	Very poor.	Very poor.	Very poor.	Poor	Poor	Good	Good	Very poor.	Poor	Good.
Agawam:										
AfA	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
AfB	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
AfC	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Beaches:										
Ba.										
Branford:										
BoA	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
BoB	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
BoC	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
[1]BrC:										
Branford part	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Holyoke part	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Carlisle:										
Ce.	Very poor.	Very poor.	Very poor.	Poor	Poor	Good	Good	Very poor.	Poor	Good.
Charlton:										
CfB	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
CfC	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
CfD	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
ChB	Very poor.	Poor	Good	Good	Good	Poor	Very poor.	Poor	Good	Very poor.
ChC	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
CnC, CnD	Very poor.	Very poor.	Good	Good	Good	Very poor.	Very poor.	Poor	Fair	Very poor.
[1]CrC:										
Charlton part	Very poor.	Very poor.	Good	Good	Good	Very poor.	Very poor.	Poor	Fair	Very poor.

See footnote at end of table.

TABLE 13.--WILDLIFE HABITAT POTENTIALS--Continued

Soil name and map symbol	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
[1]CrC:										
Hollis part	Very poor.	Very poor.	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Cheshire:										
CsB	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
CsC	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
CsD	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
CtB	Very poor.	Poor	Good	Good	Good	Poor	Very poor.	Poor	Good	Very poor.
CtC	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
CvC	Very poor.	Very poor.	Good	Good	Good	Very poor.	Very poor.	Poor	Fair	Very poor.
[1]CyC:										
Cheshire part	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
Holyoke part	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Deerfield:										
De	Poor	Fair	Fair	Fair	Fair	Poor	Poor	Fair	Fair	Poor.
Dumps:										
Du.										
Ellington:										
Eh	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
Haven:										
HcA	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
HcB	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Hinckley:										
HkA, HkB, HkC	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
[1]HME:										
Hinckley part	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Manchester part	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Hollis:										
[1]HpE:										
Hollis part	Very poor.	Very poor.	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Charlton part	Very poor.	Very poor.	Good	Good	Good	Very poor.	Very poor.	Poor	Fair	Very poor.
[1]HrC:										
Hollis part	Very poor.	Very poor.	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.

See footnote at end of table.

TABLE 13.--WILDLIFE HABITAT POTENTIALS--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
Hollis:										
Rock outcrop part.										
[1]HSE:										
Hollis part	Very poor.	Very poor.	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Rock outcrop part.										
Holyoke:										
HtC	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
[1]HuD:										
Holyoke part	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Cheshire part	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
[1]HyC:										
Holyoke part	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Rock outcrop part.										
[1]HZE:										
Holyoke part	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Rock outcrop part.										
Leicester:										
Lc	Poor	Fair	Fair	Fair	Fair	Good	Fair	Fair	Fair	Fair.
Ludlow:										
LpA	Fair	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
LpB	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
LuB	Very poor.	Poor	Good	Good	Good	Poor	Very poor.	Poor	Good	Very poor.
LvC	Very poor.	Very poor.	Good	Good	Good	Very poor.	Very poor.	Poor	Fair	Very poor.
Manchester:										
MgA, MgB, MgC	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Ninigret:										
Nn	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
Paxton:										
PbB	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
PbC	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
PbD	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.

See footnote at end of table.

TABLE 13.--WILDLIFE HABITAT POTENTIALS--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
Paxton:										
PdB	Very poor.	Poor	Good	Good	Good	Poor	Very poor.	Poor	Good	Very poor.
PdC	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
PeC, PeD	Very poor.	Very poor.	Good	Good	Good	Very poor.	Very poor.	Poor	Fair	Very poor.
Penwood:										
PnA, PnB	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Pits:										
Pr.										
Podunk:										
Ps	Poor	Fair	Fair	Good	Good	Poor	Poor	Fair	Good	Poor.
Podunk Variant:										
Pv	Poor	Fair	Fair	Good	Good	Poor	Poor	Fair	Good	Poor.
Quarries:										
Qu.										
Raynham:										
Ra	Poor	Fair	Fair	Fair	Fair	Good	Fair	Fair	Fair	Fair.
Raypol:										
Rb	Poor	Fair	Fair	Fair	Fair	Good	Fair	Fair	Fair	Fair.
Ridgebury:										
Rd	Poor	Fair	Fair	Fair	Fair	Good	Fair	Fair	Fair	Fair.
[1]RN:										
Ridgebury part	Very poor.	Very poor.	Fair	Fair	Fair	Good	Fair	Poor	Fair	Fair.
Leicester part	Very poor.	Very poor.	Fair	Fair	Fair	Good	Fair	Poor	Fair	Fair.
Whitman part	Very poor.	Very poor.	Fair	Fair	Fair	Good	Fair	Poor	Fair	Fair.
Rock outcrop:										
[1]RP:										
Rock outcrop part.										
Hollis part	Very poor.	Very poor.	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Rumney:										
Ru	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
Rumney Variant:										
Rv	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
Saco:										
Sc	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
Scarboro:										
Sr	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.

See footnote at end of table.

TABLE 13.--WILDLIFE HABITAT POTENTIALS--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herba- ceous plants	Hardwood trees	Conif- erous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
Scio:										
Ss	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
Sutton:										
SvA	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
SvB	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
SxC	Very poor.	Very poor.	Good	Good	Good	Very poor.	Very poor.	Poor	Fair	Very poor.
Urban land: Ur.										
Walpole:										
Wa	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
Watchaug:										
WcA	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
WcB	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Westbrook:										
We, Wh	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Good	Good	Very poor.	Very poor.	Good.
Wethersfield:										
WkB	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
WkC	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
WkD	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
WmB	Very poor.	Poor	Good	Good	Good	Poor	Very poor.	Poor	Good	Very poor.
WmC	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
WnC, WnD	Very poor.	Very poor.	Good	Good	Good	Very poor.	Very poor.	Poor	Fair	Very poor.
Wilbraham:										
Wr	Poor	Fair	Fair	Fair	Fair	Good	Fair	Fair	Fair	Fair.
Ws	Very poor.	Poor	Fair	Fair	Fair	Good	Fair	Poor	Fair	Fair.
[1]WT:										
Wilbraham part	Very poor.	Very poor.	Fair	Fair	Fair	Good	Fair	Poor	Fair	Fair.
Menlo part	Very poor.	Very poor.	Poor	Poor	Poor	Good	Fair	Very poor.	Poor	Fair.
Woodbridge:										
WxA	Fair	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
WxB	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.

See footnote at end of table.

TABLE 13.--WILDLIFE HABITAT POTENTIALS--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
Woodbridge:										
WyB	Very poor.	Poor	Good	Good	Good	Poor	Very poor.	Poor	Good	Very poor.
WzC	Very poor.	Very poor.	Good	Good	Good	Very poor.	Very poor.	Poor	Fair	Very poor.
Yalesville:										
YaB	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
YaC	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.

[1]This map unit is made up of two or more dominant kinds of soil. See the map unit description for the composition and behavior characteristics of the map unit.

TABLE 14.--ENGINEERING PROPERTIES AND CLASSIFICATIONS

[The symbol < means less than; > means more than. Absence of an entry indicates that data were not estimated]

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
Adrian:											
[1]AA:											
Adrian part------	0-33	Sapric material	Pt	A-8	---	---	---	---	---	---	---
	33-60	Sand, loamy sand	SP, SM	A-1, A-2	0	100	90-100	50-75	0-20	---	NP
Palms part-------	0-32	Sapric material	Pt	A-8	---	---	---	---	---	---	---
	32-60	Loam, silt loam, fine sandy loam	ML, SM	A-4	0	85-100	80-100	60-95	40-90	<25	NP-5
Agawam:											
AfA, AfB, AfC------	0-8	Fine sandy loam	SM, ML	A-4	0	95-100	90-100	65-85	40-55	---	NP-3
	8-19	Fine sandy loam, very fine sandy loam.	SM, ML	A-4	0	95-100	85-100	65-85	40-55	---	NP-3
	19-32	Fine sandy loam	SM, ML	A-4	0	90-100	85-100	60-85	35-55	---	NP
	32-60	Loamy sand, sand, gravelly sand.	SP, SM	A-2, A-3, A-1	0	90-100	65-100	30-75	0-35	---	NP
Beaches:											
Ba.											
Branford:											
BoA, BoB, BoC------	0-8	Silt loam--------	ML, SM	A-4	0	95-100	70-95	60-90	40-80	<25	NP-5
	8-24	Silt loam, loam, fine sandy loam.	ML, SM	A-4, A-2	0	80-100	60-95	40-90	30-80	<25	NP-3
	24-60	Stratified sand to gravel.	GP, SP, GM, SM	A-1, A-3	0-25	35-95	25-80	10-55	0-10	---	NP
[1]BrC:											
Branford part---	0-8	Silt loam--------	ML, SM	A-4	0	95-100	70-95	60-90	40-80	<25	NP-5
	8-24	Silt loam, loam, fine sandy loam.	ML, SM	A-4, A-2	0	80-100	60-95	40-90	30-80	<25	NP-3
	24-60	Stratified sand to gravel.	GP, SP, GM, SM	A-1, A-3	0-25	35-95	25-80	10-55	0-10	---	NP
Holyoke part----	0-6	Silt loam--------	ML, SM,	A-4, A-2	0-10	75-95	55-90	45-85	25-75	<25	NP-5
	6-13	Silt loam, very fine sandy loam, fine sandy loam.	ML, SM	A-4, A-2	0-10	75-95	55-90	45-85	25-75	<25	NP-3
	13	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Carlisle:											
Ce-----------------	0-70	Sapric material	Pt	A-8	---	---	---	---	---	---	---
Charlton:											
CfB, CfC, CfD------	0-6	Fine sandy loam	SM, ML	A-2, A-4	5-10	75-95	70-90	60-75	30-65	---	NP-5
	6-26	Fine sandy loam, gravelly fine sandy loam, sandy loam.	SM, ML	A-2, A-4	5-15	65-90	60-90	50-70	20-60	---	NP-3
	26-60	Gravelly sandy loam, gravelly fine sandy loam, fine sandy loam.	SM	A-2, A-4	5-15	60-90	60-85	50-70	20-40	---	NP

See footnote at end of table.

TABLE 14.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag- ments > 3 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct					Pct	
Charlton:											
ChB, ChC	0-6	Very stony fine sandy loam.	SM, ML	A-2, A-4	10-30	75-95	70-90	60-75	30-55	---	NP-5
	6-26	Fine sandy loam, gravelly fine sandy loam, sandy loam.	SM, ML	A-2, A-4	5-15	65-90	60-90	50-70	20-60	---	NP-3
	26-60	Fine sandy loam, gravelly fine sandy loam, gravelly sandy loam.	SM	A-2, A-4	5-15	60-90	60-85	50-70	20-40	---	NP
CnC, CnD	0-6	Extremely stony fine sandy loam.	SM, ML	A-2, A-4	15-35	75-95	70-90	60-75	30-55	---	NP-5
	6-26	Fine sandy loam, gravelly fine sandy loam.	SM, ML	A-2, A-4	5-15	65-90	60-90	50-70	20-60	---	NP-3
	26-60	Fine sandy loam, gravelly fine sandy loam, sandy loam, gravelly sandy loam.	SM	A-2, A-4	5-15	60-90	60-85	50-70	20-40	---	NP
[1]CrC:											
Charlton part	0-6	Extremely stony fine sandy loam.	SM, ML	A-2, A-4	15-35	75-95	70-90	60-75	30-65	---	NP-5
	6-26	Fine sandy loam, gravelly fine sandy loam, sandy loam.	SM, ML	A-2, A-4	5-15	65-90	60-90	50-70	20-60	---	NP-3
	26-60	Fine sandy loam, gravelly fine sandy loam, gravelly sandy loam.	SM	A-2, A-4	5-15	60-90	60-85	50-70	20-40	---	NP
Hollis part	0-3	Fine sandy loam	SM, ML	A-2, A-4	0-15	75-100	65-95	40-85	25-55	<20	NP-3
	3-14	Fine sandy loam, sandy loam.	SM, ML	A-2, A-4	0-15	75-95	65-95	40-80	20-55	---	NP
	14	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Cheshire:											
CsB, CsC, CsD	0-8	Fine sandy loam	SM, ML	A-2, A-4	0-10	85-95	80-95	60-85	30-55	<25	NP-5
	8-26	Fine sandy loam, silt loam, sandy loam.	SM, ML	A-2, A-4	0-10	85-95	80-95	55-85	25-70	<25	NP-3
	26-60	Fine sandy loam, gravelly fine sandy loam, gravelly sandy loam.	SM	A-2, A-4	0-10	75-90	70-90	40-55	25-45	---	NP
CtB, CtC	0-8	Very stony fine sandy loam.	SM, ML	A-2, A-4	10-25	85-95	80-95	60-85	30-55	<25	NP-5
	8-26	Fine sandy loam, loam, silt loam, sandy loam.	SM, ML	A-2, A-4	5-20	85-95	80-95	55-85	25-70	<25	NP-3
	26-60	Fine sandy loam, gravelly fine sandy loam, gravelly sandy loam.	SM	A-2, A-4	0-10	75-90	70-90	40-65	25-45	---	NP

See footnote at end of table.

TABLE 14.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification Unified	Classification AASHTO	Fragments > 3 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plasticity index
	In				Pct					Pct	
Cheshire:											
CvC	0-8	Extremely stony fine sandy loam	SM, ML	A-2, A-4	10-25	85-95	80-95	60-85	30-55	<25	NP-5
	8-26	Fine sandy loam, loam, silt loam, sandy loam.	SM, ML	A-2, A-4	5-20	85-95	80-95	55-85	25-70	<25	NP-3
	26-60	Fine sandy loam, gravelly fine sandy loam, gravelly sandy loam.	SM	A-2, A-4	0-10	75-90	70-90	40-65	25-45	---	NP
[1]CyC:											
Cheshire part	0-8	Very stony fine sandy loam.	SM, ML	A-2, A-4	10-25	85-95	80-95	60-85	30-55	<25	NP-5
	8-26	Fine sandy loam, loam, silt loam, sandy loam.	SM, ML	A-2, A-4	5-20	85-95	80-95	55-85	25-70	<25	NP-3
	26-60	Fine sandy loam, gravelly fine sandy loam, gravelly sandy loam.	SM	A-2, A-4	0-10	75-90	70-90	40-65	25-45	---	NP
Holyoke part	0-6	Silt loam	ML, SM,	A-4, A-2	0-10	75-95	55-90	45-85	25-75	<25	NP-5
	6-13	Silt loam, very fine sandy loam, fine sandy loam.	ML, SM	A-4, A-2	0-10	75-95	55-90	45-85	25-75	<25	NP-3
	13	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Deerfield:											
De	0-8	Loamy fine sand	SM	A-1, A-2, A-3	0	95-100	80-100	40-75	15-30	---	NP
	8-28	Loamy sand, loamy fine sand	SM	A-1, A-2, A-3	0	95-100	80-100	40-75	15-30	---	NP
	28-60	Sand, fine sand	SP, SM	A-1, A-2, A-3	0	95-100	65-100	30-75	3-30	---	NP
Dumps: Du.											
Ellington:											
Eh	0-8	Silt loam	ML, SM	A-4	0	95-100	75-95	55-95	40-85	<25	NP-7
	8-26	Silt loam, loam, fine sandy loam, very fine sandy loam.	ML, SM	A-2, A-4	0	75-100	50-95	45-95	30-85	<25	NP-5
	26-60	Gravelly sand, very gravelly sand.	SP, GP	A-1	5-30	30-70	20-60	15-45	0-10	---	NP
Haven:											
HcA, HcB	0-27	Silt loam	ML	A-4	0	90-100	90-100	85-95	70-90	<25	NP-4
	27-31	Silt loam, very fine sandy loam.	ML, SM	A-4, A-2	0	85-95	70-90	50-80	30-65	<25	NP-4
	31-60	Stratified sand to gravel.	SP, SW, GP	A-1	0	40-95	30-85	15-50	0-5	<10	NP

See footnote at end of table.

TABLE 14.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag-ments > 3 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas-ticity index
	In				Pct					Pct	
Hinckley:											
HkA, HkB, HkC------	0-8	Gravelly sandy loam.	SM	A-1, A-2	0-20	60-95	40-85	20-60	15-35	---	NP
	8-16	Gravelly loamy sand, gravelly sandy loam.	SM, GM	A-1, A-2	0-20	50-95	30-85	15-60	2-30	---	NP
	16-60	Stratified sand and gravel.	SP, GP	A-1	0-45	40-75	20-50	10-40	0-10	---	NP
[1]HME:											
Hinckley part---	0-8	Gravelly sandy loam.	SM	A-1, A-2	0-20	60-95	40-85	25-60	15-35	---	NP
	8-16	Gravelly loamy sand, gravelly sandy loam.	SM, GM	A-1, A-2	0-20	50-95	30-85	15-60	2-30	---	NP
	16-60	Stratified sand and gravel.	SP, GP	A-1	0-45	40-75	20-50	10-40	0-10	---	NP
Manchester part-	0-6	Gravelly sandy loam.	SM	A-1, A-2	0-20	70-95	60-75	30-60	15-40	---	NP
	6-16	Gravelly sandy loam, gravelly loamy sand.	SM, GM	A-1, A-2	0-20	50-90	50-70	25-50	10-30	---	NP
	16-60	Stratified sand and gravel.	SP, GW, GP	A-1	5-30	30-70	20-55	10-35	0-10	---	NP
Hollis:											
[1]HpE:											
Hollis part------	0-3	Fine sandy loam	SM, ML	A-2, A-4	0-15	75-100	65-95	40-85	25-55	<20	NP-3
	3-14	Fine sandy loam, sandy loam.	SM, ML	A-2, A-4	0-15	75-95	65-95	40-80	20-55	---	NP
	14	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Charlton part---	0-6	Extremely stony fine sandy loam.	SM, ML	A-2, A-4	15-35	75-95	70-90	60-75	30-65	---	NP-5
	6-26	Fine sandy loam, gravelly fine sandy loam, sandy loam.	SM, ML	A-2, A-4	5-15	65-90	60-90	50-70	20-60	---	NP-3
	26-60	Fine sandy loam, gravelly fine sandy loam, gravelly sandy loam.	SM	A-2, A-4	5-15	60-90	60-85	50-70	20-40	---	NP
[1]HrC:											
Hollis part------	0-3	Fine sandy loam	SM, ML	A-2, A-4	0-15	75-100	65-95	40-85	25-55	<20	NP-3
	3-14	Fine sandy loam, sandy loam.	SM, ML	A-2, A-4	0-15	75-95	65-95	40-80	20-55	---	NP
	14	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 14.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag- ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
Hollis:											
Rock outcrop part.											
[1]HSE:											
Hollis part	0-3	Fine sandy loam	SM, ML	A-2, A-4	0-15	75-100	65-95	40-85	25-55	<20	NP-3
	3-14	Fine sandy loam, sandy loam.	SM, ML	A-2, A-4	0-15	75-95	55-95	40-80	20-55	---	NP
	14	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop part.											
Holyoke:											
HtC	0-6	Silt loam	ML, SM	A-4, A-2	0-10	75-95	55-90	45-85	25-75	<25	NP-5
	6-13	Silt loam, fine sandy loam, very fine sandy loam.	ML, SM	A-4, A-2	0-10	75-95	55-90	45-85	25-75	<25	NP-3
	13	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
[1]HuD:											
Holyoke part	0-6	Silt loam	ML, SM	A-4, A-2	0-10	75-95	55-90	45-85	25-75	<25	NP-5
	6-13	Silt loam, very fine sandy loam, fine sandy loam.	ML, SM	A-4, A-2	0-10	75-95	55-90	45-85	25-75	<25	NP-3
	13	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Cheshire part	0-8	Very stony fine sandy loam.	SM, ML	A-2, A-4	10-25	85-95	80-95	60-85	30-55	<25	NP-5
	8-26	Fine sandy loam, loam, silt loam, sandy loam.	SM, ML	A-2, A-4	5-20	85-95	80-95	55-85	25-70	<25	NP-3
	26-60	Fine sandy loam, gravelly fine sandy loam, gravelly sandy loam.	SM	A-2, A-4	0-10	75-90	70-90	40-65	25-45	---	NP
[1]HyC:											
Holyoke part	0-6	Silt loam	ML, SM	A-4, A-2	0-10	75-95	55-90	45-85	25-75	<25	NP-5
	6-13	Silt loam, very fine sandy loam, fine sandy loam.	ML, SM	A-4, A-2	0-10	75-95	55-90	45-85	25-75	<25	NP-3
	13	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop part.											
[1]HZE:											
Holyoke part	0-6	Silt loam	ML, SM	A-4, A-2	0-10	75-95	55-90	45-85	25-75	<25	NP-5
	6-13	Silt loam, very fine sandy loam, fine sandy loam.	ML, SM	A-4, A-2	0-10	75-95	55-90	45-85	25-75	<25	NP-3
	13	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop part.											

See footnote at end of table.

TABLE 14.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
Leicester:											
Lc	0-6	Fine sandy loam	SM, ML	A-2, A-4	0-10	70-95	70-90	45-75	25-55	<25	NP-5
	6-23	Fine sandy loam, loam, gravelly sandy loam.	SM	A-2, A-4	5-10	70-90	60-85	40-75	25-50	---	NP
	23-60	Fine sandy loam, gravelly fine sandy loam, gravelly sandy loam.	SM	A-2, A-4	5-15	55-90	55-85	35-70	20-45	---	NP
Ludlow:											
LpA, LpB	0-8	Silt loam	ML	A-4	0-5	80-95	70-90	65-85	55-70	<45	NP-8
	8-30	Loam, silt loam, fine sandy loam	ML, SM	A-4	0-5	80-95	70-90	65-85	35-70	<45	NP-7
	30-60	Loam, gravelly loam, fine sandy loam.	ML, SM	A-4	0-10	70-90	65-85	50-80	35-65	<35	NP-7
LuB	0-8	Very stony silt loam.	ML	A-4	2-10	80-95	70-90	65-85	55-70	<45	NP-8
	8-30	Loam, silt loam, fine sandy loam	ML, SM	A-4	0-10	80-95	70-90	65-85	35-70	<45	NP-7
	30-60	Loam, gravelly loam, fine sandy loam.	ML, SM	A-4	5-15	70-90	65-85	50-80	35-65	<35	NP-7
LvC	0-8	Extremely stony silt loam.	ML	A-4	10-25	80-95	70-90	65-85	55-70	<45	NP-8
	8-30	Loam, silt loam, fine sandy loam	ML, SM	A-4	0-10	80-95	70-90	65-85	35-70	<45	NP-7
	30-60	Loam, gravelly loam, fine sandy loam.	ML, SM	A-4	5-15	70-90	65-85	50-80	35-65	<35	NP-7
Manchester:											
MgA, MgB, MgC	0-6	Gravelly sandy loam.	SM	A-1, A-2	0-20	70-95	60-75	30-60	15-40	---	NP
	6-16	Sandy loam, gravelly sandy loam, gravelly loamy sand.	SM, GM	A-1, A-2	0-20	50-90	50-70	25-50	10-30	---	NP
	16-60	Stratified sand and gravel.	SP, GW, GP	A-1	5-30	30-70	20-55	10-35	0-10	---	NP
Ninigret:											
Nn	0-8	Fine sandy loam	SM, ML	A-4	0	95-100	90-100	70-85	40-55	<25	NP-3
	8-23	Fine sandy loam, very fine sandy loam.	SM	A-2, A-4	0	95-100	90-100	65-85	35-50	---	NP
	23-60	Sand, gravelly sand.	SP, GP	A-1, A-2, A-3	0-10	60-100	45-100	25-75	0-15	---	NP
Paxton:											
PbB, PbC, PbD	0-8	Fine sandy loam	SM, ML	A-2, A-4	0-10	80-95	75-90	60-75	30-55	<30	NP-10
	8-26	Fine sandy loam, loam, gravelly fine sandy loam	SM, ML, SM-SC	A-2, A-4	0-15	70-90	65-90	55-85	25-65	<30	NP-10
	26-60	Fine sandy loam, sandy loam, gravelly sandy loam.	SM, SM-SC	A-2, A-4	0-15	70-90	60-85	40-75	20-50	<30	NP-10

See footnote at end of table.

TABLE 14.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
Paxton:											
PdB, PdC	0-8	Very stony fine sandy loam.	SM, ML	A-2, A-4	5-20	80-95	75-90	60-75	30-55	<30	NP-10
	8-26	Fine sandy loam, loam, gravelly fine sandy loam	SM, ML, SM-SC	A-2, A-4	5-20	70-90	65-90	55-85	25-65	<30	NP-10
	26-60	Fine sandy loam, sandy loam, gravelly sandy loam.	SM, SM-SC	A-2, A-4	5-15	70-90	60-85	40-75	20-50	<30	NP-10
PeC, PeD	0-8	Extremely stony fine sandy loam.	SM, ML	A-2, A-4	10-25	80-90	70-85	60-80	30-55	<30	NP-10
	8-26	Fine sandy loam, loam, gravelly fine sandy loam	SM, ML, SM-SC	A-2, A-4	5-20	70-90	65-90	55-85	25-65	<30	NP-10
	26-60	Fine sandy loam, sandy loam, gravelly sandy loam.	SM, SM-SC	A-2, A-4	5-15	70-90	60-85	40-75	20-50	<30	NP-10
Penwood:											
PnA, PnB	0-8	Loamy sand	SM	A-2	0	95-100	90-100	45-80	20-30	---	NP
	8-30	Loamy sand, loamy fine sand, sand.	SP, SM	A-2, A-3	0	95-100	90-100	45-95	0-30	---	NP
	30-60	Sand, fine sand	SP, SM	A-2, A-3	0	90-100	85-100	40-80	0-20	---	NP
Pits:											
Pr.											
Podunk:											
Ps	0-14	Fine sandy loam	SM, ML	A-4	0	100	95-100	60-85	40-55	---	NP
	14-34	Fine sandy loam, sandy loam.	SM	A-2, A-4	0	100	95-100	60-85	30-50	---	NP
	34-60	Loamy fine sand, loamy sand, sand.	SP-SM, SM	A-2, A-1	0	90-100	80-100	40-85	5-25	---	NP
Podunk Variant:											
Pv	0-9	Silt loam	ML	A-4	0-3	95-100	95-100	75-100	55-95	<25	NP-5
	9-36	Silt loam, very fine sandy loam.	ML	A-4	0-3	95-100	95-100	75-100	55-95	<25	NP-5
	36-60	Sand, loamy sand, stratified sand and gravel	SW, SP, GM	A-1, A-2	0-20	60-85	55-80	25-45	15-35	---	NP
Quarries:											
Qu.											
Raynham:											
Ra	0-8	Silt loam	ML	A-4	0	100	95-100	80-100	55-95	<35	NP-10
	8-24	Silt loam, very fine sandy loam.	ML	A-4	0	100	95-100	80-100	55-95	<35	NP-10
	24-60	Silt loam, very fine sandy loam.	ML	A-4	0	100	95-100	80-100	55-95	<35	NP-10
Raypol:											
Rb	0-8	Silt loam	ML	A-4	0	90-100	85-100	75-100	65-90	<30	NP-7
	8-29	Silt loam, very fine sandy loam, loam.	ML	A-4	0	90-100	85-100	75-100	65-90	<25	NP-5
	29-60	Gravelly sand, sand, very gravelly sand.	SP, GP	A-1, A-3 A-2	0-20	45-90	35-85	15-60	0-10	---	NP

See footnote at end of table.

TABLE 14.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag- ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
Ridgebury:											
Rd	0-6	Fine sandy loam	SM, ML	A-2, A-4	0-15	70-100	60-95	45-85	25-55	---	NP
	6-19	Sandy loam, fine sandy loam.	SM, ML	A-2, A-4	0-15	65-95	55-90	40-80	20-60	---	NP
	19-60	Sandy loam, gravelly sandy loam, fine sandy loam.	SM	A-2, A-4	0-15	65-95	55-90	35-80	20-50	---	NP
[1]RN:											
Ridgebury part	0-6	Extremely stony fine sandy loam.	SM, ML	A-2, A-4	10-30	70-100	60-95	45-85	25-55	---	NP
	6-19	Sandy loam, fine sandy loam, loam.	SM, ML	A-2, A-4	10-30	65-95	55-90	40-80	20-60	---	NP
	19-60	Sandy loam, gravelly sandy loam, fine sandy loam.	SM	A-2, A-4	10-30	65-95	55-90	35-80	20-50	---	NP
Leicester part	0-6	Extremely stony fine sandy loam.	SM, ML	A-2, A-4	5-25	70-95	70-90	45-75	25-55	<25	NP-5
	6-23	Fine sandy loam, loam, gravelly sandy loam.	SM	A-2, A-4	5-10	70-90	60-85	40-75	20-50	---	NP
	23-60	Fine sandy loam, gravelly fine sandy loam, gravelly sandy loam.	SM	A-2, A-4	5-15	65-90	55-85	35-70	20-45	---	NP
Whitman part	0-6	Extremely stony fine sandy loam	SM, ML, OL	A-2, A-4	5-20	85-95	70-90	55-75	25-55	---	NP
	6-22	Sandy loam, fine sandy loam, loam.	SM, ML	A-2, A-4	5-25	70-95	60-90	45-80	20-65	---	NP
	22-60	Sandy loam, fine loam, gravelly fine sandy loam, gravelly loam.	SM, ML	A-2, A-4	5-20	70-95	60-90	45-80	20-65	---	NP
Rock outcrop:											
[1]RP:											
Rock outcrop part.											
Hollis part	0-3	Fine sandy loam	SM, ML	A-2, A-4	0-15	75-100	65-95	40-85	25-55	<20	NP-3
	3-14	Fine sandy loam, sandy loam.	SM, ML	A-2, A-4	0-15	75-95	65-95	40-80	20-55	---	NP
	14	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rumney:											
Ru	0-6	Fine sandy loam	SM, ML	A-2, A-4	0	90-100	80-100	65-85	30-55	---	NP
	6-28	Fine sandy loam, sandy loam.	SM	A-2, A-4	0	85-100	80-100	65-85	30-50	---	NP
	28-60	Loamy sand, sand.	SP, SM	A-1, A-2, A-3	0	85-100	80-100	40-75	0-30	---	NP
Rumney Variant:											
Rv	0-9	Silt loam	ML	A-4	0-3	95-100	95-100	75-100	55-95	<25	NP-5
	9-31	Silt loam, very fine sandy loam.	ML	A-4	0-3	95-100	95-100	75-100	55-95	<25	NP-5
	31-60	Sand, loamy sand, stratified sand and gravel.	SP, SW, GM	A-1, A-2	0-20	60-90	50-85	25-45	15-25	---	NP

See footnote at end of table.

TABLE 14.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag- ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
Saco:											
Sc	0-8	Silt loam	ML	A-4	0	100	100	95-100	70-95	<40	NP-10
	8-22	Silt loam, very fine sandy loam.	ML	A-4	0	100	100	95-100	55-95	<40	NP-10
	22-41	Silt loam, very fine sandy loam.	ML	A-4	0	100	100	90-100	50-95	<25	NP-5
	41-60	Coarse sand, gravelly sand.	SP, SM	A-1	0	80-100	50-85	35-60	0-15	---	NP
Scarboro:											
Sr	0-12	Sapric material	Pt	A-8	---	---	---	---	---	---	---
	12-31	Fine sand, loamy sand, sand.	SM, SP	A-2	0	90-100	80-100	60-80	5-30	---	NP
	31-60	Loamy sand, sand	SM, SP	A-1, A-2	0	85-100	70-100	45-75	0-25	---	NP
Scio:											
Ss	0-8	Silt loam	ML	A-4	0	100	95-100	90-100	60-90	<20	NP-4
	8-42	Silt loam, very fine sandy loam.	ML	A-4	0	100	95-100	90-100	60-90	<20	NP-4
	42-60	Stratified sand and gravel, silt loam, loamy very fine sand.	ML, SM, SP	A-4, A-2, A-1	0	60-100	30-90	15-85	2-80	<10	NP-4
Sutton:											
SvA, SvB	0-6	Fine sandy loam	SM, ML	A-2, A-4	0-10	75-95	65-90	60-80	30-60	<25	NP-3
	6-28	Fine sandy loam, sandy loam.	SM, ML	A-2, A-4	0-10	75-95	65-90	50-80	25-55	<25	NP-3
	28-60	Fine sandy loam, gravelly sandy loam, sandy loam.	SM	A-2, A-4	5-15	60-90	55-85	45-70	20-45	---	NP
SxC	0-6	Extremely stony fine sandy loam.	SM, ML	A-2, A-4	5-20	75-95	65-90	60-80	30-60	<25	NP-3
	6-28	Fine sandy loam, loam, gravelly fine sandy loam.	SM, ML	A-2, A-4	5-15	75-95	65-90	50-80	25-55	<25	NP-3
	28-60	Fine sandy loam, gravelly sandy loam, sandy loam.	SM	A-2, A-4	5-15	60-90	55-85	45-70	20-45	---	NP
Udorthents, smoothed: UD.											
Urban land: Ur.											
Walpole:											
Wa	0-6	Sandy loam	SM	A-2, A-4	0-5	90-100	85-100	70-90	30-50	<25	NP-3
	6-22	Fine sandy loam, sandy loam.	SM	A-2, A-4	0-5	85-100	60-100	40-95	25-50	---	NP
	22-60	Gravelly sand, sand, stratified sand and gravel.	SP, SM, GP	A-1, A-2, A-3	0-20	55-100	50-100	25-70	0-15	---	NP

See footnote at end of table.

TABLE 14.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag- ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
Watchaug:											
WcA, WcB	0-8	Fine sandy loam	SM, ML	A-2, A-4	0-10	85-95	75-90	45-85	25-70	<25	NP-5
	8-24	Fine sandy loam, silt loam.	SM, ML	A-2, A-4	0-10	80-95	70-90	45-85	25-70	<25	NP-3
	24-60	Gravelly sandy loam, gravelly fine sandy loam, fine sandy loam.	SM	A-2, A-4	0-10	70-90	55-90	35-65	35-45	---	NP
Westbrook:											
We, Wh	0-48	Hemic material	Pt	A-8	---	---	---	---	---	---	---
	48-99	Silt loam, very fine sandy loam.	ML, CL-ML, OL	A-4	0	95-100	95-100	95-100	85-100	<25	NP-5
Wethersfield:											
WkB, WkC, WkD	0-13	Loam	ML	A-4	0-5	85-95	80-95	65-85	55-70	<45	NP-8
	13-25	Loam, silt loam, fine sandy loam.	ML	A-4	0-5	85-95	80-95	65-85	55-70	<45	NP-7
	25-60	Gravelly loam, loam, gravelly fine sandy loam, silt loam	SM, ML	A-4	0-10	75-90	70-90	55-80	40-65	<35	NP-7
WmB, WmC	0-13	Very stony loam	ML	A-4	10-20	85-95	80-95	65-85	55-70	<45	NP-8
	13-25	Loam, silt loam, fine sandy loam.	ML	A-4	5-15	85-95	80-95	65-85	55-70	<45	NP-7
	25-60	Loam, gravelly loam, gravelly fine sandy loam, silt loam	SM, ML	A-4	0-10	75-90	70-90	55-80	40-65	<35	NP-7
WnC, WnD	0-13	Extremely stony loam.	ML	A-4	10-25	85-95	80-95	65-85	55-70	<45	NP-8
	13-25	Loam, silt loam, fine sandy loam.	ML	A-4	5-15	85-95	80-95	65-85	55-70	<45	NP-7
	25-60	Loam, gravelly loam, gravelly fine sandy loam, silt loam	SM, ML	A-4	0-10	75-90	70-90	55-80	40-65	<35	NP-7
Wilbraham:											
Wr	0-8	Silt loam	ML	A-4	0-5	80-95	70-95	65-85	55-70	<45	NP-8
	8-25	Loam, silt loam	ML	A-4	0-5	80-95	70-95	65-85	55-70	<45	NP-7
	25-60	Loam, gravelly loam, silt loam, gravelly fine sandy loam	ML	A-4	0-10	70-90	65-85	60-80	55-65	<35	NP-7
Ws	0-8	Very stony silt loam.	ML	A-4	3-10	80-95	70-95	65-85	55-70	<45	NP-8
	8-25	Loam, silt loam	ML	A-4	0-10	80-95	70-95	65-85	55-70	<45	NP-7
	25-60	Loam, gravelly loam, silt loam, gravelly fine sandy loam	ML	A-4	0-10	70-90	65-85	60-80	55-65	<35	NP-7

See footnote at end of table.

TABLE 14.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
Wilbraham:											
[1]WT:											
Wilbraham part--	0-8	Extremely stony silt loam.	ML	A-4	5-15	80-95	70-95	65-85	55-70	<45	NP-8
	8-25	Loam, silt loam, loam.	ML	A-4	0-10	80-95	70-95	65-85	55-70	<45	NP-7
	25-60	Loam, gravelly loam, silt loam, gravelly fine sandy loam	ML	A-4	0-10	70-90	65-85	60-80	55-65	<35	NP-7
Menlo part-------	0-8	Extremely stony silt loam.	ML	A-4	5-15	80-95	65-90	65-85	55-70	<45	NP-8
	8-22	Silt loam, loam, fine sandy loam.	ML	A-4	0-10	80-95	65-90	60-85	50-70	<40	NP-6
	22-60	Gravelly loam, loam, fine sandy loam.	ML, GM	A-4	0-10	65-90	55-85	45-80	35-70	<45	NP-8
Woodbridge:											
WxA, WxB----------	0-7	Fine sandy loam	SM, ML	A-2, A-4	0-10	85-95	70-90	60-85	30-65	<30	NP-10
	7-25	Fine sandy loam, loam, sandy loam.	SM, ML	A-2, A-4	0-15	75-95	65-90	55-75	25-55	<30	NP-10
	25-60	Fine sandy loam, loam, gravelly fine sandy loam, gravelly sandy loam.	SM	A-2, A-4	5-15	70-90	60-90	50-75	25-50	<30	NP-10
WyB---------------	0-7	Very stony fine sandy loam.	SM, ML	A-2, A-4	5-10	85-95	70-90	60-85	30-65	<30	NP-10
	7-25	Fine sandy loam, loam, sandy loam.	SM, ML	A-2, A-4	5-10	75-95	65-90	55-75	25-60	<30	NP-10
	25-60	Fine sandy loam, loam, gravelly fine sandy loam, gravelly sandy loam.	SM	A-2, A-4	5-15	70-90	60-90	50-75	25-50	<30	NP-10
WzC---------------	0-7	Extremely stony fine sandy loam.	SM, ML	A-2, A-4	5-15	85-95	70-90	60-85	30-65	<30	NP-10
	7-25	Fine sandy loam, loam, sandy loam.	SM, ML	A-2, A-4	5-10	75-95	65-90	55-75	25-60	<30	NP-10
	25-60	Fine sandy loam, loam, gravelly fine sandy loam, gravelly sandy loam.	SM	A-2, A-4	5-15	70-90	60-90	50-75	25-50	<30	NP-10
Yalesville:											
YaB, YaC----------	0-8	Fine sandy loam	SM, ML	A-2, A-4	0-5	85-95	75-95	50-85	30-70	---	NP
	8-25	Fine sandy loam, silt loam, loam.	SM, ML, GM	A-2, A-4	0-10	60-95	50-95	35-85	25-70	---	NP
	25-36	Sandy loam, loam.	SM, GM	A-2, A-4	0-20	50-90	40-80	25-65	15-45	---	NP
	36	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

[1]This map unit is made up of two or more dominant kinds of soil. See the map unit description for the composition and behavior characteristics of the map unit.

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS

[The symbol < means less than; > means more than. Entries under "Erosion factors--T" apply to the entire profile. Dashes indicate that data were not estimated]

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete	Erosion factors: K	Erosion factors: T
	In	In/hr	In/in	pH	Mmhos/cm					
Adrian:										
[1]AA:										
Adrian part	0-33	2.0-6.0	0.35-0.45	4.5-6.5	<2	---	High	Moderate	---	---
	33-60	2.0-6.0	0.03-0.08	4.5-6.5	<2	Low	High	Moderate	---	
Palms part	0-32	2.0-6.0	0.35-0.45	5.6-6.5	<2	---	High	Moderate	0.10	5
	32-60	0.6-2.0	0.05-0.19	6.1-7.0	<2	Low	High	Low	0.10	
Agawam:										
AfA, AfB, AfC	0-8	2.0-6.0	0.13-0.25	5.1-6.0	<2	Low	Low	High	0.28	3
	8-19	2.0-6.0	0.11-0.21	5.1-6.0	<2	Low	Low	---	0.28	
	19-32	2.0-6.0	0.11-0.18	5.1-6.0	<2	Low	Low	---	0.28	
	32-60	6.0-20	0.01-0.09	5.1-6.0	<2	Low	Low	---	0.17	
Beaches:										
Ba.										
Branford:										
BoA, BoB, BoC	0-8	0.6-6.0	0.11-0.28	4.5-6.0	<2	Low	Low	High	0.24	3
	8-24	0.6-6.0	0.11-0.24	4.5-6.0	<2	Low	Low	High	0.64	
	24-60	>6.0	0.01-0.06	4.5-6.0	<2	Low	Low	High	0.17	
[1]BrC:										
Branford part	0-8	0.6-6.0	0.11-0.28	4.5-6.0	<2	Low	Low	High	0.24	3
	8-24	0.6-6.0	0.11-0.24	4.5-6.0	<2	Low	Low	High	0.64	
	24-60	>6.0	0.01-0.06	4.5-6.0	<2	Low	Low	High	0.17	
Holyoke part	0-6	0.6-2.0	0.12-0.22	4.5-6.0	<2	Low	Low	High	0.24	2
	6-13	0.6-2.0	0.11-0.22	4.5-6.0	<2	Low	Low	High	0.43	
	13	---	---	---	---	---	---	---	---	
Carlisle:										
Ce	0-70	2.0-6.0	0.35-0.45	5.6-7.3	<2	---	High	Low	---	---
Charlton:										
CfB, CfC, CfD	0-6	0.6-6.0	0.11-0.23	4.5-6.0	<2	Low	Low	High	0.20	3
	6-26	0.6-6.0	0.08-0.20	4.5-6.0	<2	Low	Low	High	0.43	
	26-60	0.6-6.0	0.05-0.16	4.5-6.0	<2	Low	Low	High	0.43	
ChB, ChC	0-6	0.6-6.0	0.11-0.23	4.5-6.0	<2	Low	Low	High	0.17	3
	6-26	0.6-6.0	0.08-0.20	4.5-6.0	<2	Low	Low	High	0.43	
	26-60	0.6-6.0	0.05-0.16	4.5-6.0	<2	Low	Low	High	0.43	
CnC, CnD	0-6	0.6-6.0	0.11-0.15	4.5-6.0	<2	Low	Low	High	0.17	3
	6-26	0.6-6.0	0.08-0.20	4.5-6.0	<2	Low	Low	High	0.43	
	26-60	0.6-6.0	0.05-0.16	4.5-6.0	<2	Low	Low	High	0.43	
[1]CrC:										
Charlton part	0-6	0.6-6.0	0.11-0.15	4.5-6.0	<2	Low	Low	High	0.17	3
	6-26	0.6-6.0	0.08-0.20	4.5-6.0	<2	Low	Low	High	0.43	
	26-60	0.6-6.0	0.05-0.16	4.5-6.0	<2	Low	Low	High	0.43	
Hollis part	0-3	0.6-6.0	0.10-0.21	4.5-6.0	<2	Low	Low	High	0.20	2
	3-14	0.6-6.0	0.06-0.18	4.5-6.0	<2	Low	Low	High	0.28	
	14	---	---	---	---	---	---	---	---	
Cheshire:										
CsB, CsC, CsD	0-8	0.6-2.0	0.11-0.28	4.5-6.0	<2	Low	Low	High	0.20	3
	8-26	0.6-2.0	0.08-0.24	4.5-6.0	<2	Low	Low	High	0.43	
	26-60	0.6-2.0	0.05-0.15	4.5-6.0	<2	Low	Low	High	0.43	
CtB, CtC, CvC	0-8	0.6-2.0	0.11-0.28	4.5-6.0	<2	Low	Low	High	0.17	3
	8-26	0.6-2.0	0.08-0.24	4.5-6.0	<2	Low	Low	High	0.43	
	26-60	0.6-2.0	0.05-0.15	4.5-6.0	<2	Low	Low	High	0.43	

See footnote at end of table.

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete	Erosion factors: K	Erosion factors: T
	In	In/hr	In/in	pH	Mmhos/cm					
Cheshire:										
[1]CyC:										
Cheshire part	0-8	0.6-2.0	0.11-0.28	4.5-6.0	<2	Low	Low	High	0.17	3
	8-26	0.6-2.0	0.08-0.24	4.5-6.0	<2	Low	Low	High	0.43	
	26-60	0.6-2.0	0.05-0.15	4.5-6.0	<2	Low	Low	High	0.43	
Holyoke part	0-6	0.6-2.0	0.12-0.22	4.5-6.0	<2	Low	Low	High	0.24	2
	6-13	0.6-2.0	0.11-0.22	4.5-6.0	<2	Low	Low	High	0.43	
	13	---	---	---	---	---	---	---	---	
Deerfield:										
De	0-8	6.0-20	0.07-0.13	4.5-6.0	<2	Low	Low	High	0.17	5
	8-28	6.0-20.0	0.01-0.13	4.5-6.0	<2	Low	Low	High	0.17	
	28-60	>20	0.01-0.08	4.5-6.0	<2	Low	Low	High	0.17	
Dumps:										
Du.										
Ellington:										
Eh	0-8	0.6-2.0	0.15-0.22	5.1-6.0	<2	Low	Low	High	0.24	3
	8-26	0.6-2.0	0.13-0.22	5.1-6.0	<2	Low	Low	High	0.64	
	26-60	>6.0	0.01-0.06	5.1-6.0	<2	Low	Low	High	0.17	
Haven:										
HcA, HcB	0-27	0.6-2.0	0.15-0.25	4.5-6.0	<2	Low	Low	High	0.43	3
	27-31	0.6-6.0	0.08-0.12	4.5-6.0	<2	Low	Low	High	0.64	
	31-60	>20	0.01-0.03	4.5-6.0	<2	Low	Low	High	0.17	
Hinckley:										
HkA, HkB, HkC	0-8	6.0-20	0.03-0.18	4.5-6.0	<2	Low	Low	High	0.17	3
	8-16	6.0-20	0.01-0.11	4.5-6.0	<2	Low	Low	High	0.17	
	16-60	>20	0.01-0.06	4.5-6.0	<2	Low	Low	High	0.17	
[1]HME:										
Hinckley part	0-8	6.0-20	0.03-0.18	4.5-6.0	<2	Low	Low	High	0.17	3
	8-16	6.0-20	0.01-0.11	4.5-6.0	<2	Low	Low	High	0.17	
	16-60	>20	0.01-0.06	4.5-6.0	<2	Low	Low	High	0.17	
Manchester part	0-6	6.0-18.0	0.03-0.18	4.5-6.0	<2	Low	Low	High	0.17	3
	6-16	6.0-20.0	0.01-0.11	4.5-6.0	<2	Low	Low	High	0.17	
	16-60	>20.0	0.01-0.06	4.5-6.0	<2	Low	Low	High	0.17	
Hollis:										
[1]HpE:										
Hollis part	0-3	0.6-6.0	0.10-0.21	4.5-6.0	<2	Low	Low	High	0.20	2
	3-14	0.6-6.0	0.06-0.18	4.5-6.0	<2	Low	Low	High	0.28	
	14	---	---	---	---	---	---	---	---	
Charlton part	0-6	0.6-6.0	0.11-0.15	4.5-6.0	<2	Low	Low	High	0.17	3
	6-26	0.6-6.0	0.08-0.20	4.5-6.0	<2	Low	Low	High	0.43	
	26-60	0.6-6.0	0.05-0.16	4.5-6.0	<2	Low	Low	High	0.43	
[1]HrC:										
Hollis part	0-3	0.6-6.0	0.10-0.21	4.5-6.0	<2	Low	Low	High	0.20	2
	3-14	0.6-6.0	0.06-0.18	4.5-6.0	<2	Low	Low	High	0.28	
	14	---	---	---	---	---	---	---	---	
Rock outcrop part.										
[1]HSE:										
Hollis part	0-3	0.6-6.0	0.10-0.21	4.5-6.0	<2	Low	Low	High	0.20	2
	3-14	0.6-6.0	0.06-0.18	4.5-6.0	<2	Low	Low	High	0.28	
	14	---	---	---	---	---	---	---	---	
Rock outcrop part.										

See footnote at end of table.

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete	Erosion factors: K	Erosion factors: T
	In	In/hr	In/in	pH	Mmhos/cm					
Holyoke:										
HtC	0-6	0.6-2.0	0.12-0.22	4.5-6.0	<2	Low	Low	High	0.24	2
	6-13	0.6-2.0	0.11-0.22	4.5-6.0	<2	Low	Low	High	0.43	
	13	---	---	---	---	---	---	---	---	
[1]HuD:										
Holyoke part	0-6	0.6-2.0	0.12-0.22	4.5-6.0	<2	Low	Low	High	0.24	2
	6-13	0.6-2.0	0.11-0.22	4.5-6.0	<2	Low	Low	High	0.43	
	13	---	---	---	---	---	---	---	---	
Cheshire part	0-8	0.6-2.0	0.11-0.28	4.5-6.0	<2	Low	Low	High	0.17	3
	8-26	0.6-2.0	0.08-0.24	4.5-6.0	<2	Low	Low	High	0.43	
	26-60	0.6-2.0	0.05-0.15	4.5-6.0	<2	Low	Low	High	0.43	
[1]HyC:										
Holyoke part	0-6	0.6-2.0	0.12-0.22	4.5-6.0	<2	Low	Low	High	0.24	2
	6-13	0.6-2.0	0.11-0.22	4.5-6.0	<2	Low	Low	High	0.43	
	13	---	---	---	---	---	---	---	---	
Rock outcrop part.										
[1]HZE:										
Holyoke part	0-6	0.6-2.0	0.12-0.22	4.5-6.0	<2	Low	Low	High	0.24	2
	6-13	0.6-2.0	0.11-0.22	4.5-6.0	<2	Low	Low	High	0.43	
	13	---	---	---	---	---	---	---	---	
Rock outcrop part.										
Leicester:										
Lc	0-6	0.6-6.0	0.11-0.24	4.5-6.0	<2	Low	Low	High	0.17	3
	6-23	0.6-6.0	0.08-0.20	4.5-6.0	<2	Low	Low	High	0.43	
	23-60	0.6-6.0	0.04-0.16	4.5-6.0	<2	Low	Low	High	0.43	
Ludlow:										
LpA, LpB	0-8	0.6-2.0	0.11-0.28	4.5-6.0	<2	Low	Low	Moderate	0.24	3
	8-30	0.6-2.0	0.09-0.24	4.5-6.0	<2	Low	Low	Moderate	0.43	
	30-60	<0.2	0.08-0.12	4.5-6.5	<2	Low	Low	Moderate	0.17	
LuB	0-8	0.6-2.0	0.11-0.28	4.5-6.0	<2	Low	Low	Moderate	0.17	3
	8-30	0.6-2.0	0.09-0.24	4.5-6.0	<2	Low	Low	Moderate	0.43	
	30-60	<0.2	0.08-0.12	4.5-6.5	<2	Low	Low	Moderate	0.17	
LvC	0-8	0.6-2.0	0.11-0.28	4.5-6.0	<2	Low	Low	Moderate	0.17	3
	8-30	0.6-2.0	0.09-0.24	4.5-6.0	<2	Low	Low	Moderate	0.43	
	30-60	<0.2	0.08-0.12	4.5-6.5	<2	Low	Low	Moderate	0.17	
Manchester:										
MgA, MgB, MgC	0-6	6.0-20.0	0.03-0.18	4.5-6.0	<2	Low	Low	High	0.17	3
	6-16	6.0-20.0	0.01-0.11	4.5-6.0	<2	Low	Low	High	0.17	
	16-60	>20.0	0.01-0.06	4.5-6.0	<2	Low	Low	High	0.17	
Ninigret:										
Nn	0-8	2.0-6.0	0.13-0.25	4.5-6.0	<2	Low	Low	High	0.28	3
	8-23	2.0-6.0	0.06-0.18	4.5-6.0	<2	Low	Low	High	0.43	
	23-60	6.0-20	0.01-0.13	4.5-6.0	<2	Low	Low	High	0.17	
Paxton:										
PbB, PbC, PbD, PdB, PdC	0-8	0.6-2.0	0.11-0.23	5.1-6.5	<2	Low	Low	Moderate	0.24	3
	8-26	0.6-2.0	0.08-0.20	5.1-6.5	<2	Low	Low	Moderate	0.43	
	26-60	0.06-0.2	0.05-0.12	5.1-6.5	<2	Low	Low	Moderate	0.17	
PeC, PeD	0-8	0.6-2.0	0.11-0.15	5.1-6.5	<2	Low	Low	Moderate	0.24	3
	8-26	0.6-2.0	0.08-0.20	5.1-6.5	<2	Low	Low	Moderate	0.43	
	26-60	0.06-0.2	0.05-0.12	5.1-6.5	<2	Low	Low	Moderate	0.17	

See footnote at end of table.

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Risk of corrosion		Erosion factors	
							Uncoated steel	Concrete	K	T
	In	In/hr	In/in	pH	Mmhos/cm					
Penwood:										
PnA, PnB	0-8	6.0-20	0.08-0.13	4.5-6.5	<2	Low	Low	High	0.17	5
	8-30	6.0-20	0.02-0.13	4.5-6.5	<2	Low	Low	High	0.17	
	30-60	6.0-20	0.01-0.08	4.5-6.5	<2	Low	Low	High	0.17	
Pits:										
Pr.										
Podunk:										
Ps	0-14	2.0-6.0	0.11-0.24	4.5-6.0	<2	Low	Moderate	Moderate	0.20	3
	14-34	2.0-6.0	0.09-0.18	4.5-6.0	<2	Low	Moderate	Moderate	0.43	
	34-60	2.0-20	0.01-0.13	4.5-6.0	<2	Low	Moderate	Moderate	0.17	
Podunk Variant:										
Pv	0-9	0.2-2.0	0.18-0.24	4.5-6.0	<2	Low	Low	High	0.43	4
	9-36	0.2-2.0	0.16-0.22	4.5-6.0	<2	Low	Low	High	0.43	
	36-60	6.0-20	0.03-0.08	4.5-6.0	<2	Low	Low	High	0.17	
Quarries:										
Qu.										
Raynham:										
Ra	0-8	0.6-2.0	0.20-0.25	5.1-6.5	<2	Low	High	Moderate	0.49	3
	8-24	0.2-2.0	0.18-0.22	5.1-6.5	<2	Low	High	Moderate	0.64	
	24-60	0.06-0.2	0.18-0.22	5.6-7.3	<2	Low	High	Moderate	0.64	
Raypol:										
Rb	0-8	0.6-2.0	0.15-0.28	4.5-5.5	<2	Low	High	Moderate	0.49	3
	8-29	0.6-2.0	0.15-0.26	4.5-5.5	<2	Low	High	Moderate	0.49	
	29-60	>6.0	0.06-0.10	5.1-6.5	<2	Low	High	Moderate	0.17	
Ridgebury:										
Rd	0-6	0.6-6.0	0.11-0.24	4.5-6.0	<2	Low	High	High	0.24	3
	6-19	0.6-6.0	0.08-0.20	4.5-6.0	<2	Low	High	High	0.43	
	19-60	<0.2	---	4.5-6.0	<2	Low	High	High	0.17	
[1]RN:										
Ridgebury part	0-6	0.6-6.0	0.11-0.24	4.5-6.0	<2	Low	High	High	0.24	3
	6-19	0.6-6.0	0.08-0.20	4.5-6.0	<2	Low	High	High	0.43	
	19-60	<0.2	---	4.5-6.0	<2	Low	High	High	0.17	
Leicester part	0-6	0.6-6.0	0.11-0.28	4.5-6.0	<2	Low	Low	High	0.17	3
	6-23	0.6-6.0	0.08-0.16	4.5-6.0	<2	Low	Low	High	0.43	
	23-60	0.6-6.0	0.04-0.16	4.5-6.0	<2	Low	Low	High	0.43	
Whitman part	0-6	0.6-6.0	0.11-0.28	4.5-6.5	<2	Low	High	High	0.24	3
	6-22	0.6-6.0	0.08-0.20	4.5-6.5	<2	Low	High	High	0.43	
	22-60	<0.2	---	4.5-6.5	<2	Low	High	High	0.17	
	35-60	<0.2	---	4.5-6.5	<2	Low	High	High	0.17	
Rock outcrop:										
[1]RP:										
Rock outcrop part.										
Hollis part	0-3	0.6-6.0	0.10-0.21	4.5-6.0	<2	Low	Low	High	0.20	2
	3-14	0.6-6.0	0.06-0.18	4.5-6.0	<2	Low	Low	High	0.28	
	14	---	---	---	---	-------	-------	-------	---	
Rumney:										
Ru	0-6	2.0-6.0	0.10-0.30	4.5-6.0	<2	Low	High	High	0.24	4
	6-28	2.0-6.0	0.07-0.18	4.5-6.0	<2	Low	High	High	0.43	
	28-60	>6.0	0.01-0.13	4.5-6.0	<2	Low	High	High	0.17	
Rumney Variant:										
Rv	0-9	0.2-2.0	0.18-0.26	5.1-6.5	<2	Low	High	Moderate	0.43	4
	9-31	0.2-2.0	0.18-0.24	5.1-6.5	<2	Low	High	Moderate	0.43	
	31-60	>6.0	0.03-0.08	5.1-6.5	<2	Low	High	Moderate	0.17	

See footnote at end of table.

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Risk of corrosion		Erosion factors	
							Uncoated steel	Concrete	K	T
	In	In/hr	In/in	pH	Mmhos/cm					
Saco:										
Sc	0-8	0.6-2.0	0.17-0.30	5.1-6.5	<2	Low	Low	Moderate	---	---
	8-22	0.6-2.0	0.15-0.26	5.1-6.5	<2	Low	Low	Moderate	0.64	
	22-41	0.6-2.0	0.10-0.26	5.6-7.3	<2	Low	Low	Low	0.64	
	41-60	0.6-20	0.01-0.13	5.6-7.3	<2	Low	Low	Low	0.17	
Scarboro:										
Sr	0-12	6.0-20	0.30-0.45	4.5-6.0	<2	Low	Moderate	High	---	---
	12-31	>6.0	0.07-0.13	4.5-6.0	<2	Low	Moderate	High	0.17	
	31-60	>6.0	0.01-0.13	4.5-6.0	<2	Low	Moderate	High	0.17	
Scio:										
Ss	0-8	0.6-2.0	0.18-0.21	4.5-6.0	<2	Low	Moderate	High	0.49	3
	8-36	0.6-2.0	0.17-0.20	4.5-6.0	<2	Low	Moderate	High	0.64	
	36-60	0.06-20	0.02-0.19	5.1-6.5	<2	Low	Moderate	High	0.64	
Sutton:										
SvA, SvB	0-6	0.6-6.0	0.11-0.25	4.5-6.0	<2	Low	Low	High	0.20	3
	6-28	0.6-6.0	0.07-0.20	4.5-6.0	<2	Low	Low	High	0.43	
	28-60	0.6-6.0	0.04-0.16	4.5-6.0	<2	Low	Low	High	0.43	
SxC	0-6	0.6-6.0	0.11-0.23	4.5-6.0	<2	Low	Low	High	0.20	3
	6-28	0.6-6.0	0.07-0.16	4.5-6.5	<2	Low	Low	High	0.43	
	28-60	0.6-6.0	0.04-0.16	4.5-6.0	<2	Low	Low	High	0.43	
Udorthents, smoothed: UD.										
Urban land: Ur.										
Walpole:										
Wa	0-6	2.0-6.0	0.10-0.20	4.5-6.0	<2	Low	Low	High	0.20	3
	6-22	2.0-6.0	0.07-0.18	4.5-6.0	<2	Low	Low	High	0.28	
	22-60	>6.0	0.01-0.13	4.5-6.0	<2	Low	Low	High	0.17	
Watchaug:										
WcA, WcB	0-8	0.6-2.0	0.11-0.28	4.5-6.0	<2	Low	Low	High	0.20	3
	8-24	0.6-2.0	0.08-0.24	4.5-6.0	<2	Low	Low	High	0.43	
	24-60	0.6-2.0	0.05-0.15	4.5-6.5	<2	Low	Low	High	0.43	
Westbrook:										
We, Wh	0-48	0.6-20	0.18-0.35	5.1-7.3	>2	Low	High	High	---	---
	48-99	0.6-2.0	0.16-0.26	5.1-7.3	>2	Low	High	High	0.64	
Wethersfield:										
WkB, WkC, WkD	0-13	0.6-2.0	0.11-0.28	4.5-5.5	<2	Low	Low	Moderate	0.24	3
	13-25	0.6-2.0	0.09-0.24	4.5-5.5	<2	Low	Low	Moderate	0.43	
	25-60	<0.2	0.08-0.12	4.5-6.0	<2	Low	Low	Moderate	0.17	
WmB, WmC	0-13	0.6-2.0	0.11-0.28	4.5-5.5	<2	Low	Low	Moderate	0.17	3
	13-25	0.6-2.0	0.09-0.24	4.5-5.5	<2	Low	Low	Moderate	0.43	
	25-60	<0.2	0.08-0.12	4.5-6.0	<2	Low	Low	Moderate	0.17	
WnC, WnD	0-13	0.6-2.0	0.11-0.28	4.5-5.5	<2	Low	Low	Moderate	0.17	3
	13-25	0.6-2.0	0.09-0.24	4.5-5.5	<2	Low	Low	Moderate	0.43	
	25-60	<0.2	0.08-0.12	4.5-6.0	<2	Low	Low	Moderate	0.17	
Wilbraham:										
Wr	0-8	0.6-2.0	0.12-0.28	4.5-5.5	<2	Low	High	Moderate	0.24	3
	8-25	0.6-2.0	0.10-0.26	4.5-5.5	<2	Low	High	Moderate	0.43	
	25-60	<0.2	0.08-0.12	4.5-6.0	<2	Low	High	Moderate	0.17	

See footnote at end of table.

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete	Erosion factors: K	Erosion factors: T
	In	In/hr	In/in	pH	Mmhos/cm					
Wilbraham:										
Ws	0-8	0.6-2.0	0.12-0.28	4.5-5.5	<2	Low	Low	Moderate	0.17	3
	8-25	0.6-2.0	0.10-0.26	4.5-5.5	<2	Low	Low	Moderate	0.43	
	25-60	<0.2	0.08-0.12	4.5-6.0	<2	Low	Low	Moderate	0.17	
[1]WT:										
Wilbraham part	0-8	0.6-2.0	0.12-0.28	4.5-5.5	<2	Low	Low	Moderate	0.17	3
	8-25	0.6-2.0	0.10-0.26	4.5-5.5	<2	Low	Low	Moderate	0.43	
	25-60	<0.2	0.08-0.12	4.5-6.0	<2	Low	Low	Moderate	0.17	
Menlo part	0-8	0.6-2.0	0.12-0.28	4.5-6.0	<2	Low	Low	Moderate	0.17	3
	8-22	0.6-2.0	0.10-0.26	4.5-6.0	<2	Low	Low	Moderate	0.28	
	22-60	<0.2	0.08-0.12	5.1-6.5	<2	Low	Low	Moderate	0.17	
Woodbridge:										
WxA, WxB	0-7	0.6-6.0	0.11-0.23	5.1-6.0	<2	Low	Moderate	Moderate	0.24	3
	7-25	0.6-6.0	0.08-0.20	5.1-6.0	<2	Low	Moderate	Moderate	0.43	
	25-60	<0.2	0.05-0.12	5.1-6.0	<2	Low	Moderate	Moderate	0.17	
WyB	0-7	0.6-6.0	0.11-0.23	5.1-6.0	<2	Low	Moderate	Moderate	0.24	3
	7-25	0.6-6.0	0.08-0.20	5.1-6.0	<2	Low	Moderate	Moderate	0.43	
	25-60	<0.2	0.05-0.12	5.1-6.0	<2	Low	Moderate	Moderate	0.17	
WzC	0-7	0.6-6.0	0.11-0.23	5.1-6.0	<2	Low	Moderate	Moderate	0.24	3
	7-25	0.6-6.0	0.08-0.20	5.1-6.0	<2	Low	Moderate	Moderate	0.43	
	25-60	<0.2	0.05-0.12	5.1-6.0	<2	Low	Moderate	Moderate	0.17	
Yalesville:										
YaB, YaC	0-8	0.6-6.0	0.11-0.28	4.5-6.0	<2	Low	Low	High	0.28	3
	8-25	0.6-6.0	0.08-0.24	4.5-6.0	<2	Low	Low	High	0.43	
	25-36	2.0-6.0	0.05-0.15	4.5-6.0	<2	Low	Low	High	0.43	
	36	---	---	---	---	---	---	---	---	

[1]This map unit is made up of two or more dominant kinds of soil. See the map unit description for the composition and behavior characteristics of the map unit.

TABLE 16.--SOIL AND WATER FEATURES

[Absence of an entry indicates the feature is not a concern. The definitions of "flooding" and "water table" in the Glossary explain the terms "brief," "apparent," and "perched." The symbol < means less than; > means greater than]

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Potential frost action
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness	
					Ft			In		
Adrian:										
[1]AA:										
[2]Adrian part	A/D	None	---	---	+1-0	Apparent	Nov-May	>60	---	High.
[2]Palms part	A/D	None	---	---	+1-0	Apparent	Nov-May	>60	---	High.
Agawam:										
AfA, AfB, AfC	B	None	---	---	>3.5	Apparent	Nov-Apr	>60	---	Low.
Beaches:										
Ba.										
Branford:										
BoA, BoB, BoC	B	None	---	---	>6.0	---	---	>60	---	Moderate.
[1]BrC:										
Branford part	B	None	---	---	>6.0	---	---	>60	---	Moderate.
Holyoke part	C/D	None	---	---	>6.0	---	---	10-20	Hard	Moderate.
Carlisle:										
[2]Ce	A/D	None	---	---	+1-0	Apparent	Nov-May	>60	---	High.
Charlton:										
CfB, CfC, CfD, ChB, ChC, CnC, CnD	B	None	---	---	>6.0	---	---	>60	---	Low.
[1]CrC:										
Charlton part	B	None	---	---	---	---	---	>60	---	Low.
Hollis part	C/D	None	---	---	>6.0	---	---	10-20	Hard	Moderate.
Cheshire:										
CsB, CsC, CsD	B	None	---	---	>6.0	---	---	>60	---	Moderate.
CtB, CtC, CvC	B	None	---	---	---	---	---	>60	---	Moderate.
[1]CyC:										
Cheshire part	B	None	---	---	---	---	---	>60	---	Moderate.
Holyoke part	C/D	None	---	---	>6.0	---	---	10-20	Hard	Moderate.
Deerfield:										
De	B	None	---	---	1.5-3.5	Apparent	Dec-Apr	>60	---	Moderate.
Dumps:										
Du.										
Ellington:										
Eh	B	None	---	---	1.5-3.5	Apparent	Nov-Apr	>60	---	High.
Haven:										
HcA, HcB	B	None	---	---	>3.5	Apparent	---	>60	---	Moderate.
Hinckley:										
HkA, HkB, HkC	A	None	---	---	>6.0	---	---	>60	---	Low.
[1]HME:										
Hinckley part	A	None	---	---	>6.0	---	---	>60	---	Low.
Manchester part	A	None	---	---	>6.0	---	---	>60	---	Low.

See footnotes at end of table.

TABLE 16.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydro-logic group	Flooding			High water table			Bedrock		Potential frost action
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hard-ness	
					Ft			In		
Hollis:										
[1]HpE:										
Hollis part	C/D	None	---	---	>6.0	---	---	10-20	Hard	Moderate.
Charlton part	B	None	---	---	>6.0	---	---	>60	---	Low.
[1]HrC:										
Hollis part	C/D	None	---	---	>6.0	---	---	10-20	Hard	Moderate.
Rock outcrop part.										
[1]HSE:										
Hollis part	C/D	None	---	---	>6.0	---	---	10-20	Hard	Moderate.
Rock outcrop part.										
Holyoke:										
HtC	C/D	None	---	---	>6.0	---	---	10-20	Hard	Moderate.
[1]HuD:										
Holyoke part	C/D	None	---	---	>6.0	---	---	10-20	Hard	Moderate.
Cheshire part	B	None	---	---	>6.0	---	---	>60	---	Moderate.
[1]HyC:										
Holyoke part	C/D	None	---	---	>6.0	---	---	10-20	Hard	Moderate.
Rock outcrop part.										
[1]HZE:										
Holyoke part	C/D	None	---	---	>6.0	---	---	10-20	Hard	Moderate.
Rock outcrop part.										
Leicester:										
Lc	C	None	---	---	0-0.5	Apparent	Nov-Apr	>60	---	High.
Ludlow:										
LpA, LpB, LuB, LvC	C	None	---	---	1.5-3.5	Perched	Nov-Apr	>60	---	High.
Manchester:										
MgA, MgB, MgC	A	None	---	---	>6.0	---	---	>60	---	Low.
Ninigret:										
Nn	B	None	---	---	1.5-3.5	Apparent	Nov-Apr	>60	---	Moderate.
Paxton:										
PbB, PbC, PbD	C	None	---	---	>6.0	---	---	>60	---	Moderate.
PdB, PdC, PeC, PeD	C	None	---	---	>6.0	---	---	>60	---	Moderate.
Penwood:										
PnA, PnB	A	None	---	---	>3.5	---	---	>60	---	Low.
Pits:										
Pr.										
Podunk:										
Ps	B	Frequent	Brief	Nov-May	1.5-3.5	Apparent	Nov-May	>60	---	Moderate.
Podunk Variant:										
Pv	B	Frequent	Brief	Nov-May	1.5-3.5	Apparent	Dec-May	>60	---	High.

See footnotes at end of table.

TABLE 16.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding: Frequency	Flooding: Duration	Flooding: Months	High water table: Depth	High water table: Kind	High water table: Months	Bedrock: Depth	Bedrock: Hardness	Potential frost action
					Ft			In		
Quarries: Qu.										
Raynham: Ra	C	None	---	---	0-0.5	Apparent	Nov-May	>60	---	High.
Raypol: Rb	C	None	---	---	0-0.5	Apparent	Nov-May	>60	---	High.
Ridgebury: Rd	C	None	---	---	0-0.5	Perched	Nov-May	>60	---	High.
[1]RN: Ridgebury part	C	None	---	---	0-0.5	Perched	Nov-May	>60	---	High.
Leicester part	C	None	---	---	0-0.5	Apparent	Nov-May	>60	---	High.
Whitman part	D	None	---	---	0	Perched	Sep-May	>60	---	High.
Rock outcrop: [1]RP: Rock outcrop part.										
Hollis part	C/D	None	---	---	>6.0	---	---	10-20	Hard	Moderate.
Rumney: Ru	C	Frequent	Brief	Nov-May	0-0.5	Apparent	Nov-Apr	>60	---	High.
Rumney Variant: Rv	C	Frequent	Brief	Nov-May	0-0.5	Apparent	Nov-Apr	>60	---	High.
Saco: Sc	D	Frequent	Brief	Nov-May	0	Apparent	Nov-Apr	>60	---	High.
Scarboro: Sr	D	Rare	---	---	0	Apparent	Jan-Dec	>60	---	High.
Scio: Ss	B	None	---	---	1.5-3.5	Apparent	Nov-Apr	>60	---	High.
Sutton: SvA, SvB, SxC	B	None	---	---	1.5-3.5	Apparent	Nov-Apr	>60	---	Moderate.
Urban land: Ur.										
Walpole: Wa	C	None	---	---	0-0.5	Apparent	Nov-Apr	>60	---	High.
Watchaug: WcA, WcB	B	None	---	---	1.5-3.5	Apparent	Nov-Apr	>60	---	Moderate.
Westbrook: [2]We, [2]Wh	D	Frequent	Very brief	Jan-Dec	+1-0.0	Apparent	Jan-Dec	>60	---	---
Wethersfield: WkB, WkC, WkD, WmB, WmC, WnC, WnD	C	None	---	---	>6.0	---	---	>60	---	Moderate.
Wilbraham: Wr, Ws	C	None	---	---	0-0.5	Perched	Nov-Apr	>60	---	High.
[1]WT: Wilbraham part	C	None	---	---	0-0.5	Perched	Nov-Apr	>60	---	High.
Menlo part	D	None	---	---	0	Perched	Nov-Apr	>60	---	High.

See footnotes at end of table.

TABLE 16.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Potential frost action
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness	
					Ft			In		
Woodbridge: WxA, WxB, WyB, WzC	C	None	---	---	1.5-3.5	Perched	Nov-Mar	>60	Hard	High.
Yalesville: YaB, YaC	C	None	---	---	>6.0	---	---	20-40	Hard	Moderate.

[1] This map unit is made up of two or more dominant kinds of soil. See the map unit description for the composition and behavior characteristics of the map unit.
[2] In the "High water table--Depth" column, a plus sign preceding the range in depth indicates that the water table is above the surface of the soil. The first numeral in the range indicates how high the water rises above the surface. The second numeral indicates the depth below the surface.

TABLE 17.--CLASSIFICATION OF THE SOILS

[An asterisk in the first column indicates that the soil is a taxadjunct to the series. See text for a description of those characteristics of the soil that are outside the range of the series]

Soil name	Family or higher taxonomic class
Adrian	Sandy or sandy-skeletal, mixed, euic, mesic Terric Medisaprists
Agawam	Coarse-loamy over sandy or sandy-skeletal, mixed, mesic Typic Dystrochrepts
Branford	Coarse-loamy over sandy or sandy-skeletal, mixed, mesic Typic Dystrochrepts
Carlisle	Euic, mesic Typic Medisaprists
Charlton	Coarse-loamy, mixed, mesic Typic Dystrochrepts
Cheshire	Coarse-loamy, mixed, mesic Typic Dystrochrepts
Deerfield	Mixed, mesic Aquic Udipsamments
Ellington	Coarse-loamy over sandy or sandy-skeletal, mixed, mesic Aquic Dystrochrepts
Haven	Coarse-loamy over sandy or sandy-skeletal, mixed, mesic Typic Dystrochrepts
Hinckley	Sandy-skeletal, mixed, mesic Typic Udorthents
Hollis	Loamy, mixed, mesic Lithic Dystrochrepts
Holyoke	Loamy, mixed, mesic Lithic Dystrochrepts
Leicester	Coarse-loamy, mixed, acid, mesic Aeric Haplaquepts
Ludlow	Coarse-loamy, mixed, mesic Typic Fragiochrepts
Manchester	Sandy-skeletal, mixed, mesic Typic Udorthents
Menlo	Coarse-loamy, mixed, mesic Aeric Fragiaquepts
Ninigret	Coarse-loamy over sandy or sandy-skeletal, mixed, mesic Aquic Dystrochrepts
Palms	Loamy, mixed, euic, mesic Terric Medisaprists
Paxton	Coarse-loamy, mixed, mesic Typic Fragiochrepts
Penwood	Mixed, mesic Typic Udipsamments
Podunk	Coarse-loamy, mixed, mesic Fluvaquentic Dystrochrepts
Podunk Variant	Coarse-loamy over sandy or sandy-skeletal, mixed, mesic Fluventic Dystrochrepts
*Raynham	Coarse-silty, mixed, nonacid, mesic Aeric Haplaquepts
Raypol	Coarse-loamy over sandy or sandy-skeletal, mixed, acid, mesic Aeric Haplaquepts
Ridgebury	Coarse-loamy, mixed, mesic Aeric Fragiaquepts
Rumney	Coarse-loamy, mixed, acid, mesic Typic Fluvaquents
Rumney Variant	Coarse-loamy over sandy or sandy-skeletal, mixed, mesic Fluventic Umbric Dystrochrepts
*Saco	Coarse-silty, mixed, nonacid, mesic Fluvaquentic Humaquepts
Scarboro	Sandy, mixed, mesic Histic Humaquepts
Scio	Coarse-silty, mixed, mesic Aquic Dystrochrepts
Sutton	Coarse-loamy, mixed, mesic Aquic Dystrochrepts
Walpole	Sandy, mixed, mesic Aeric Haplaquepts
Watchaug	Coarse-loamy, mixed, mesic Aquic Dystrochrepts
Westbrook	Euic, mesic Typic Sulfihemists
Wethersfield	Coarse-loamy, mixed, mesic Typic Fragiochrepts
Whitman	Coarse-loamy, mixed, mesic Typic Fragiaquepts
Wilbraham	Coarse-loamy, mixed, mesic Aquic Fragiochrepts
Woodbridge	Coarse-loamy, mixed, mesic Typic Fragiochrepts
Yalesville	Coarse-loamy, mixed, mesic Typic Dystrochrepts

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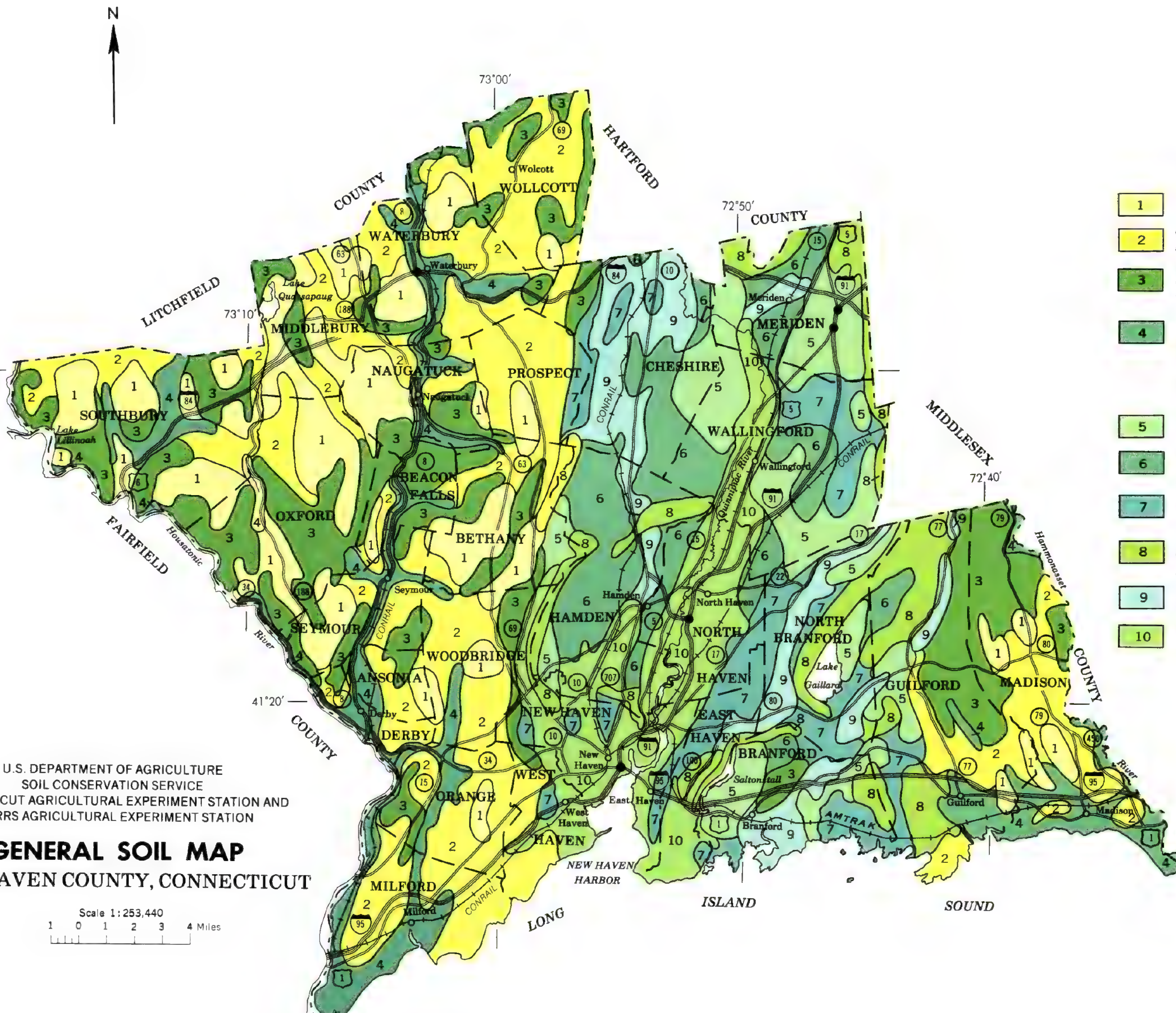


SOIL ASSOCIATIONS

SOILS OF THE NEW ENGLAND UPLANDS THAT FORMED MAINLY IN MATERIAL THAT WEATHERED FROM GNEISS AND SCHIST

1 — Paxton-Woodbridge-Ridgebury: Nearly level to steep, well drained to poorly drained, loamy soils that have a fragipan; on drumloidal glacial till uplands

2 — Charlton-Hollis-Leicester: Gently sloping to steep, somewhat excessively drained to poorly drained, loamy soils; on broad glacial till plains

3 — Hollis-Charlton-Rock outcrop: Gently sloping to very steep, somewhat excessively drained and well drained, loamy soils; on glacial till uplands where the relief is affected by the underlying bedrock

4 — Agawam-Hinckley-Walpole: Nearly level to sloping, excessively drained to poorly drained, loamy and sandy soils; on glacial outwash plains and terraces

SOILS OF THE CONNECTICUT VALLEY LOWLANDS THAT FORMED MAINLY IN MATERIAL THAT WEATHERED FROM TRIASSIC SANDSTONE AND CONGLOMERATE

5 — Wethersfield-Ludlow-Wilbraham: Nearly level to steep, well drained to poorly drained, loamy soils that have a fragipan; on drumloidal glacial till uplands

6 — Cheshire-Yalesville: Gently sloping to steep, well drained, loamy soils; on broad glacial till plains

7 — Cheshire-Holyoke: Gently sloping to steep, somewhat excessively drained and well drained, loamy soils; on broad glacial till plains where the relief is affected by the underlying bedrock

8 — Holyoke-Rock outcrop-Cheshire: Gently sloping to very steep, somewhat excessively drained and well drained, loamy soils and Rock outcrop; on glacial till uplands where the relief is affected by the underlying bedrock

9 — Branford-Manchester: Nearly level to sloping, excessively drained and well drained, loamy and sandy soils; on glacial outwash plains and terraces

10 — Penwood-Manchester-Deerfield: Nearly level to sloping, excessively drained to moderately well drained, sandy soils; on broad outwash plains

Compiled 1978

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
CONNECTICUT AGRICULTURAL EXPERIMENT STATION AND
STORRS AGRICULTURAL EXPERIMENT STATION

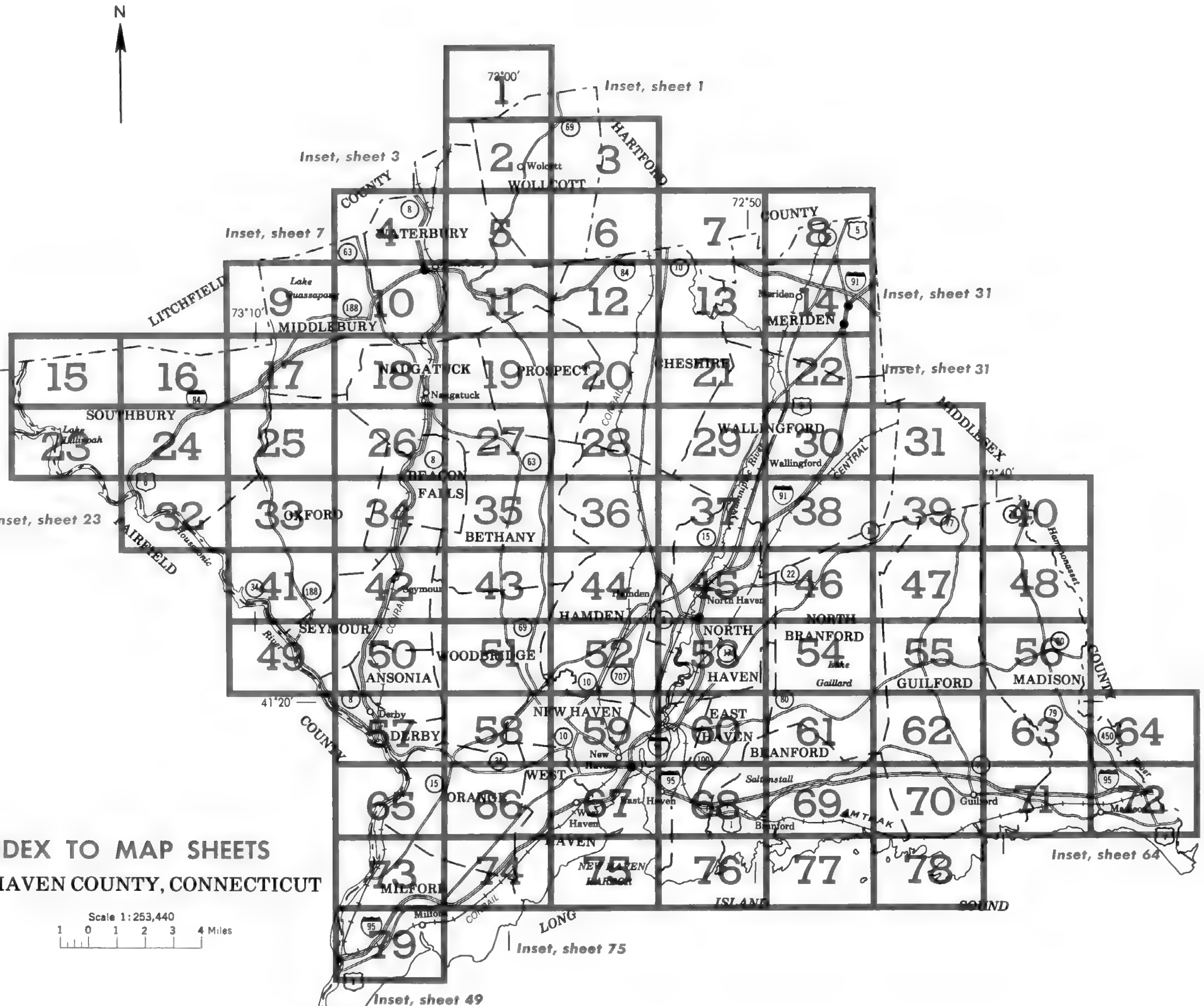
GENERAL SOIL MAP

NEW HAVEN COUNTY, CONNECTICUT

Scale 1:253,440

1 0 1 2 3 4 Miles

Each area outlined on this map consists of more than one kind of soil. The map is thus meant for general planning rather than a basis for decisions on the use of specific tracts.



INDEX TO MAP SHEETS

NEW HAVEN COUNTY, CONNECTICUT

SOIL LEGEND

The first letter, always a capital, is the initial letter of the soil name. The second letter is a capital if the mapping unit is broadly defined; otherwise, it is a small letter. The third letter, always a capital, A, B, C, D, or E, indicates the slope. Most symbols without a slope letter are those of nearly level soils, but some are for broadly defined units that have a considerable range of slope.

SYMBOL	NAME
AA	Adrian and Palms mucks *
Afa	Agawam fine sandy loam, 0 to 3 percent slopes
AfB	Agawam fine sandy loam, 3 to 8 percent slopes
AfC	Agawam fine sandy loam, 8 to 15 percent slopes
Ba	Beaches
BoA	Branford silt loam, 0 to 3 percent slopes
BoB	Branford silt loam, 3 to 8 percent slopes
BoC	Branford silt loam, 8 to 15 percent slopes
BrC	Branford-Holyoke silt loams, 3 to 15 percent slopes
CE	Carlisle muck
CfB	Charlton fine sandy loam, 3 to 8 percent slopes
CfC	Charlton fine sandy loam, 8 to 15 percent slopes
CfD	Charlton fine sandy loam, 15 to 25 percent slopes
ChB	Charlton very stony fine sandy loam, 3 to 8 percent slopes
ChC	Charlton very stony fine sandy loam, 8 to 15 percent slopes
CnC	Charlton extremely stony fine sandy loam, 3 to 15 percent slopes
CnD	Charlton extremely stony fine sandy loam, 15 to 35 percent slopes
CrC	Charlton-Hollis fine sandy loams, 3 to 15 percent slopes
CsB	Cheshire fine sandy loam, 3 to 8 percent slopes
CsC	Cheshire fine sandy loam, 8 to 15 percent slopes
CsD	Cheshire fine sandy loam, 15 to 25 percent slopes
CtB	Cheshire very stony fine sandy loam, 3 to 8 percent slopes
CtC	Cheshire very stony fine sandy loam, 8 to 15 percent slopes
CvC	Cheshire extremely stony fine sandy loam, 3 to 15 percent slopes
CyC	Cheshire-Holyoke complex, 3 to 15 percent slopes
De	Deerfield loamy fine sand
Du	Dumps
Eh	Ellington silt loam
HcA	Haven silt loam, 0 to 3 percent slopes
HcB	Haven silt loam, 3 to 8 percent slopes
HkA	Hinckley gravelly sandy loam, 0 to 3 percent slopes
HkB	Hinckley gravelly sandy loam, 3 to 8 percent slopes
HkC	Hinckley gravelly sandy loam, 8 to 15 percent slopes
HME	Hinckley and Manchester soils, 15 to 35 percent slopes *
HpE	Hollis-Charlton fine sandy loams, 15 to 35 percent slopes
HrC	Hollis-Rock outcrop complex, 3 to 15 percent slopes
HSE	Hollis-Rock outcrop complex, 15 to 35 percent slopes *
HtC	Holyoke silt loam, rocky, 3 to 15 percent slopes
HuD	Holyoke-Cheshire complex, 15 to 35 percent slopes
HyC	Holyoke-Rock outcrop complex, 3 to 15 percent slopes
HZE	Holyoke-Rock outcrop complex, 15 to 35 percent slopes *
Lc	Leicester fine sandy loam
LpA	Ludlow silt loam, 0 to 3 percent slopes
LpB	Ludlow silt loam, 3 to 8 percent slopes
LuB	Ludlow very stony silt loam, 3 to 8 percent slopes
LvC	Ludlow extremely stony silt loam, 3 to 15 percent slopes
MgA	Manchester gravelly sandy loam, 0 to 3 percent slopes
MgB	Manchester gravelly sandy loam, 3 to 8 percent slopes
MgC	Manchester gravelly sandy loam, 8 to 15 percent slopes
Nn	Ninigret fine sandy loam
PbB	Paxton fine sandy loam, 3 to 8 percent slopes
PbC	Paxton fine sandy loam, 8 to 15 percent slopes
PbD	Paxton fine sandy loam, 15 to 25 percent slopes
PdB	Paxton very stony fine sandy loam, 3 to 8 percent slopes
PdC	Paxton very stony fine sandy loam, 8 to 15 percent slopes
PeC	Paxton extremely stony fine sandy loam, 3 to 15 percent slopes
PeD	Paxton extremely stony fine sandy loam, 15 to 35 percent slopes
PnA	Penwood loamy sand, 0 to 3 percent slopes
PnB	Penwood loamy sand, 3 to 8 percent slopes
Pr	Pits, gravel
Ps	Podunk fine sandy loam
Pv	Podunk Variant silt loam
Qu	Quarries
Ra	Raynham silt loam
Rb	Raypol silt loam
Rd	Ridgebury fine sandy loam
RN	Ridgebury, Leicester and Whitman extremely stony fine sandy loams *
RP	Rock outcrop-Hollis complex *
Ru	Rumney fine sandy loam
Rv	Rumney Variant silt loam
Sc	Saco silt loam
Sr	Scarboro muck
Ss	Scio silt loam
SvA	Sutton fine sandy loam, 0 to 3 percent slopes
SvB	Sutton fine sandy loam, 3 to 8 percent slopes
SxC	Sutton extremely stony fine sandy loam, 3 to 15 percent slopes
UD	Udorthents, smoothed *
Ur	Urban land
Wa	Walpole sandy loam
WcA	Watchaug fine sandy loam, 0 to 3 percent slopes
WcB	Watchaug fine sandy loam, 3 to 8 percent slopes
We	Westbrook mucky peat
Wh	Westbrook mucky peat, low salt
WkB	Wethersfield loam, 3 to 8 percent slopes
WkC	Wethersfield loam, 8 to 15 percent slopes
WkD	Wethersfield loam, 15 to 25 percent slopes
WmB	Wethersfield very stony loam, 3 to 8 percent slopes
WmC	Wethersfield very stony loam, 8 to 15 percent slopes
WnC	Wethersfield extremely stony loam, 3 to 15 percent slopes
WnD	Wethersfield extremely stony loam, 15 to 35 percent slopes
Wr	Wilbraham silt loam
Ws	Wilbraham very stony silt loam
WT	Wilbraham and Menlo extremely stony silt loams *
WxA	Woodbridge fine sandy loam, 0 to 3 percent slopes
WxB	Woodbridge fine sandy loam, 3 to 8 percent slopes
WyB	Woodbridge very stony fine sandy loam, 3 to 8 percent slopes
WzC	Woodbridge extremely stony fine sandy loam, 3 to 15 percent slopes
YaB	Yalesville fine sandy loam, 3 to 8 percent slopes
YaC	Yalesville fine sandy loam, 8 to 15 percent slopes

* The composition of these units is more variable than others in the survey area, but has been controlled well enough to be interpreted for the expected use of the soils.

CONVENTIONAL AND SPECIAL SYMBOLS LEGEND

CULTURAL FEATURES

BOUNDARIES

- National, state or province
- County or parish
- Minor civil division
- Reservation (national forest or park, state forest or park, and large airport)
- Land grant
- Limit of soil survey (label)
- Field sheet matchline & neatline

AD HOC BOUNDARY (label)

- Small airport, airfield, park, oilfield, cemetery, or flood pool — Davis Airstrip; FLOOD POOL LINE

STATE COORDINATE TICK

LAND DIVISION CORNERS (sections and land grants)

ROADS

- Divided (median shown if scale permits)
- Other roads
- Trail

ROAD EMBLEMS & DESIGNATIONS

- Interstate — 79
- Federal — 410
- State — 52
- County, farm or ranch — 378

RAILROAD

POWER TRANSMISSION LINE (normally not shown)

PIPE LINE (normally not shown)

FENCE (normally not shown)

LEVEES

- Without road
- With road
- With railroad

DAMS

- Large (to scale)
- Medium or small — water; w

PITS

- Gravel pit
- Mine or quarry

MISCELLANEOUS CULTURAL FEATURES

- Farmstead, house (omit in urban areas)
- Church
- School
- Indian mound (label) — Indian Mound
- Located object (label) — Tower
- Tank (label) — GAS
- Wells, oil or gas
- Windmill
- Kitchen midden

WATER FEATURES

DRAINAGE

- Perennial, double line
- Perennial, single line
- Intermittent
- Drainage end
- Canals or ditches
  - Double-line (label) — CANAL
  - Drainage and/or irrigation

LAKES, PONDS AND RESERVOIRS

- Perennial — water; w
- Intermittent — int; i

MISCELLANEOUS WATER FEATURES

- Marsh or swamp
- Spring
- Well, artesian
- Well, irrigation
- Wet spot

SPECIAL SYMBOLS FOR SOIL SURVEY

SOIL DELINEATIONS AND SYMBOLS — CeA; FoB2

ESCARPMENTS

- Bedrock (points down slope)
- Other than bedrock (points down slope)

SHORT STEEP SLOPE

GULLY

DEPRESSION OR SINK

SOIL SAMPLE SITE (normally not shown) — S

MISCELLANEOUS

- Blowout
- Clay spot
- Gravelly spot
- Gumbo, slick or scabby spot (sodic)
- Dumps and other similar non soil areas
- Prominent hill or peak
- Rock outcrop (includes sandstone and shale)
- Saline spot
- Sandy spot
- Severely eroded spot
- Slide or slip (tips point upslope)
- Stony spot, very stony spot

NEW HAVEN COUNTY, CONNECTICUT NO. 1

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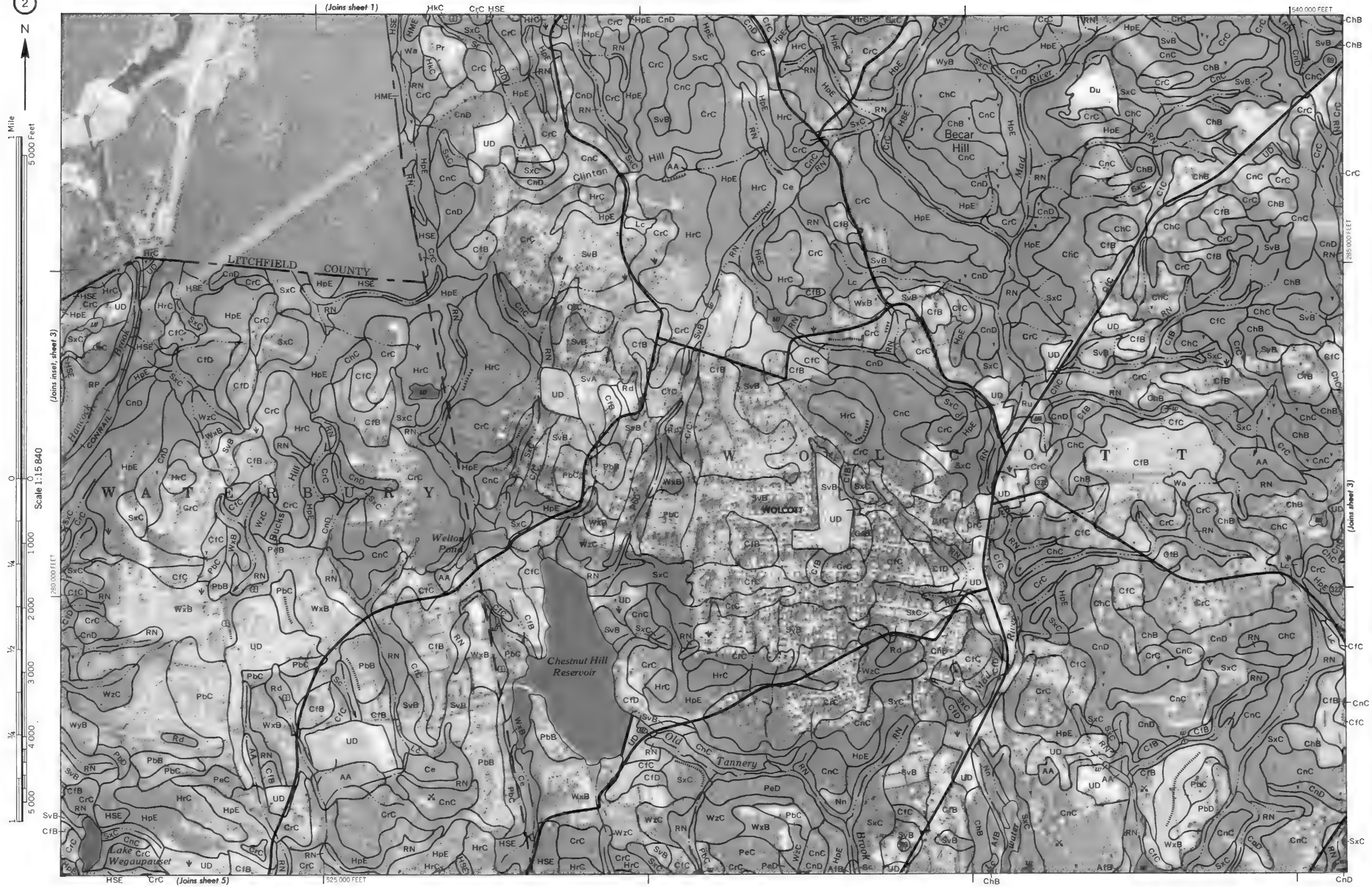

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NEW HAVEN COUNTY, CONNECTICUT NO. 2

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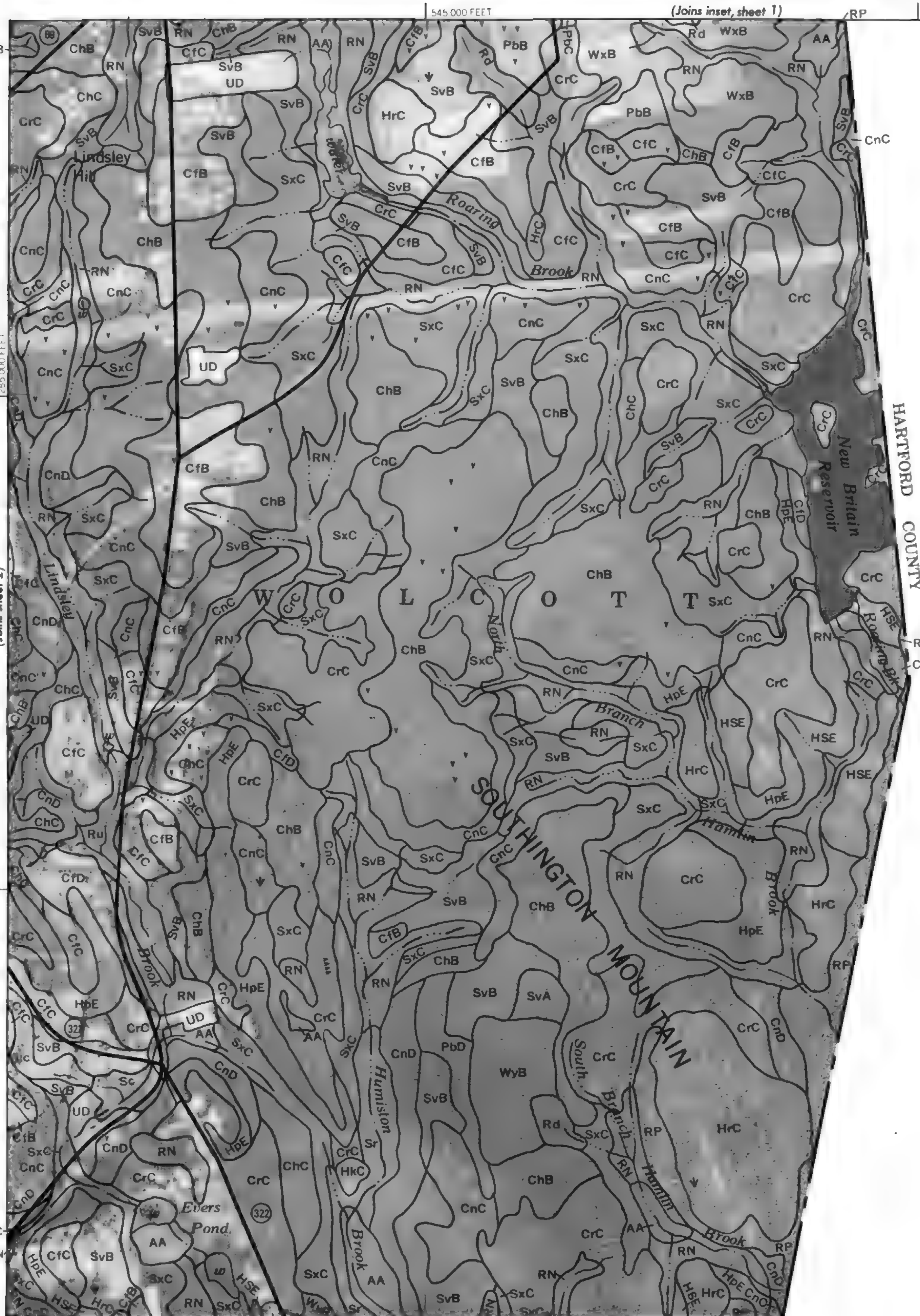

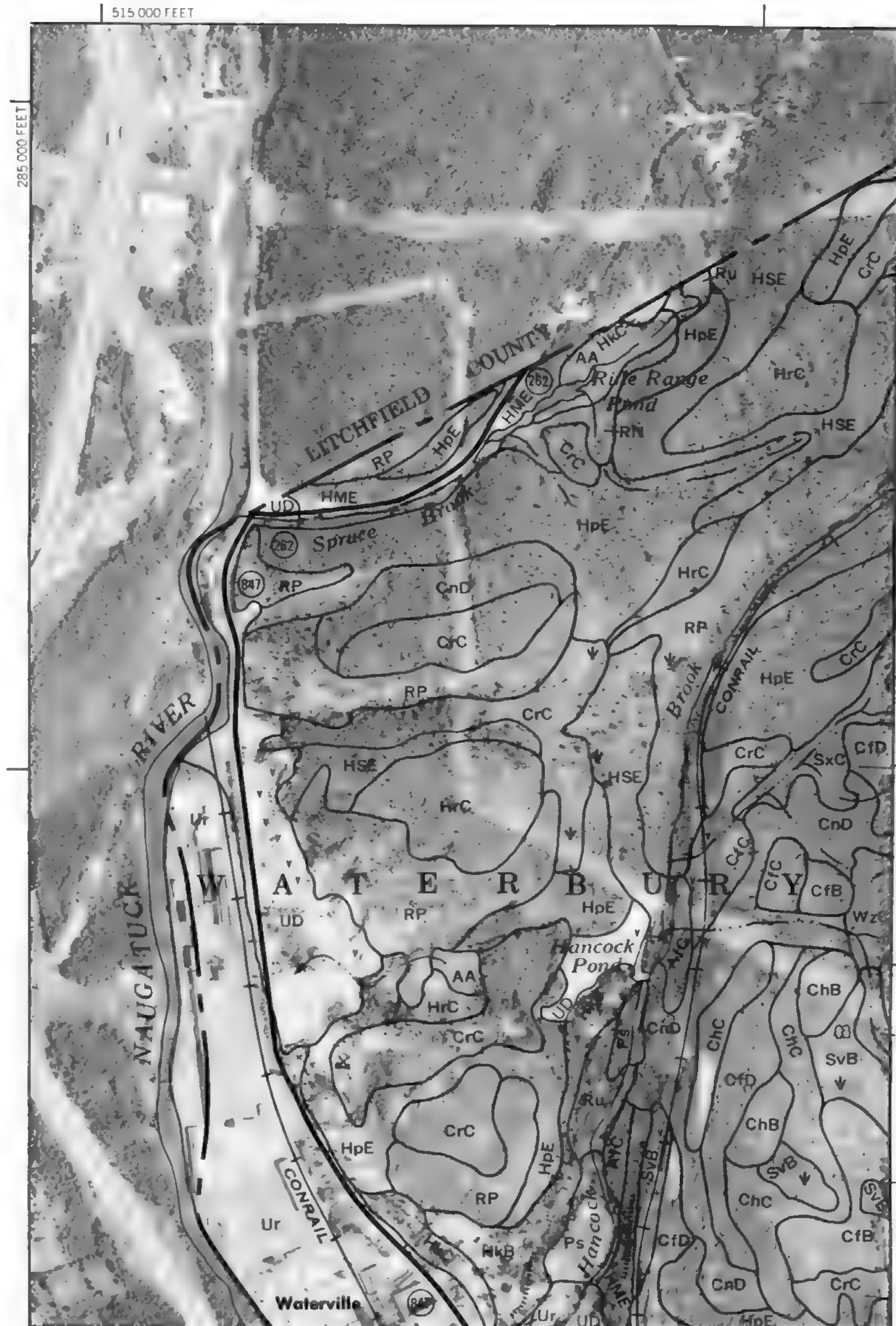

560 000 FEET

N

1 Mile

5 000 Feet

Scale 1:15 840

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1 Mile
5 000 Feet
Scale 1:15 840

NEW HAVEN COUNTY, CONNECTICUT NO. 5

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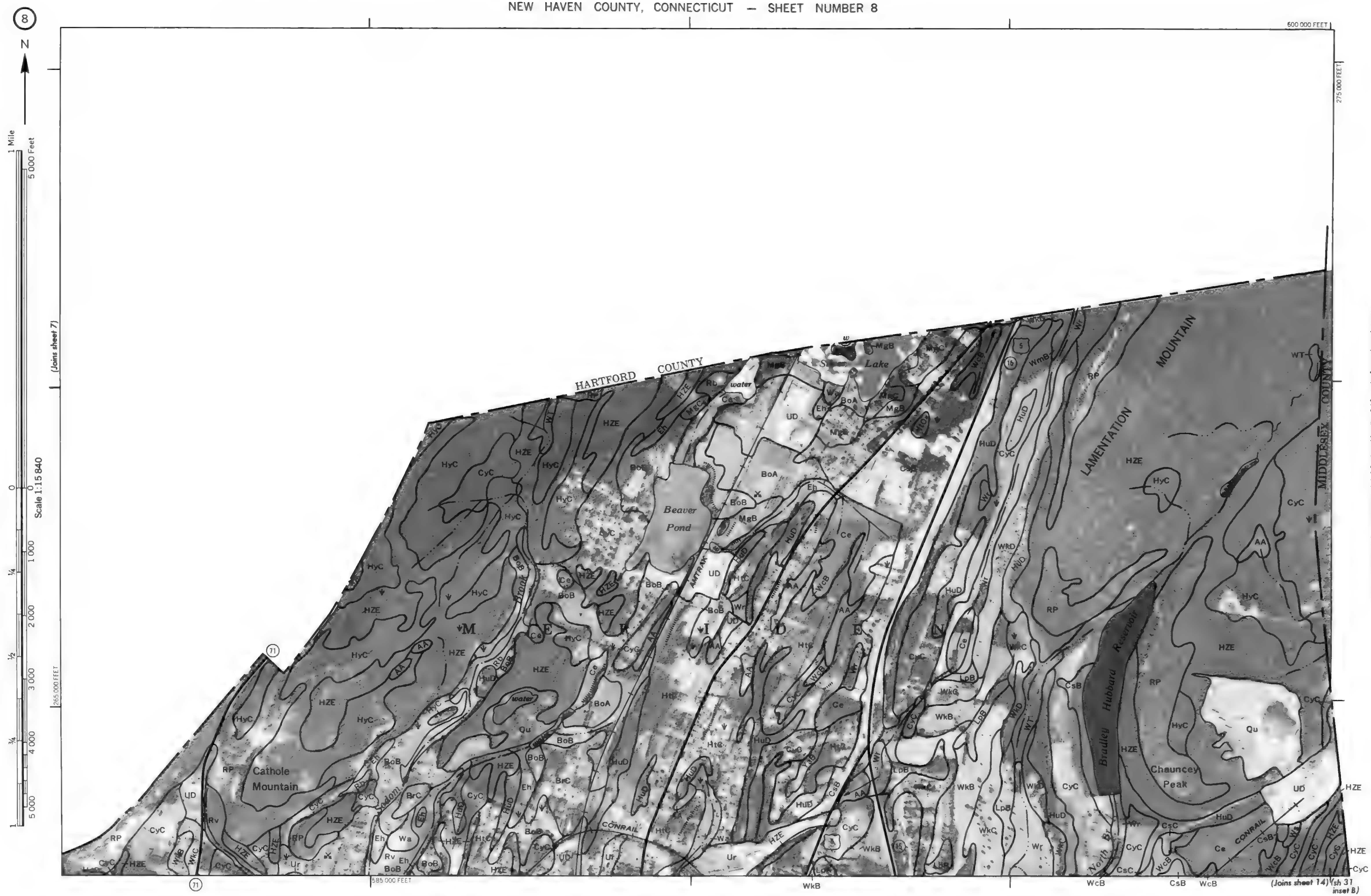
This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

NEW HAVEN COUNTY, CONNECTICUT NO. 7

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

NEW HAVEN COUNTY, CONNECTICUT NO. 9

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

NEW HAVEN COUNTY, CONNECTICUT — SHEET NUMBER 10

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

11

NEW HAVEN COUNTY, CONNECTICUT NO. 11

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

N

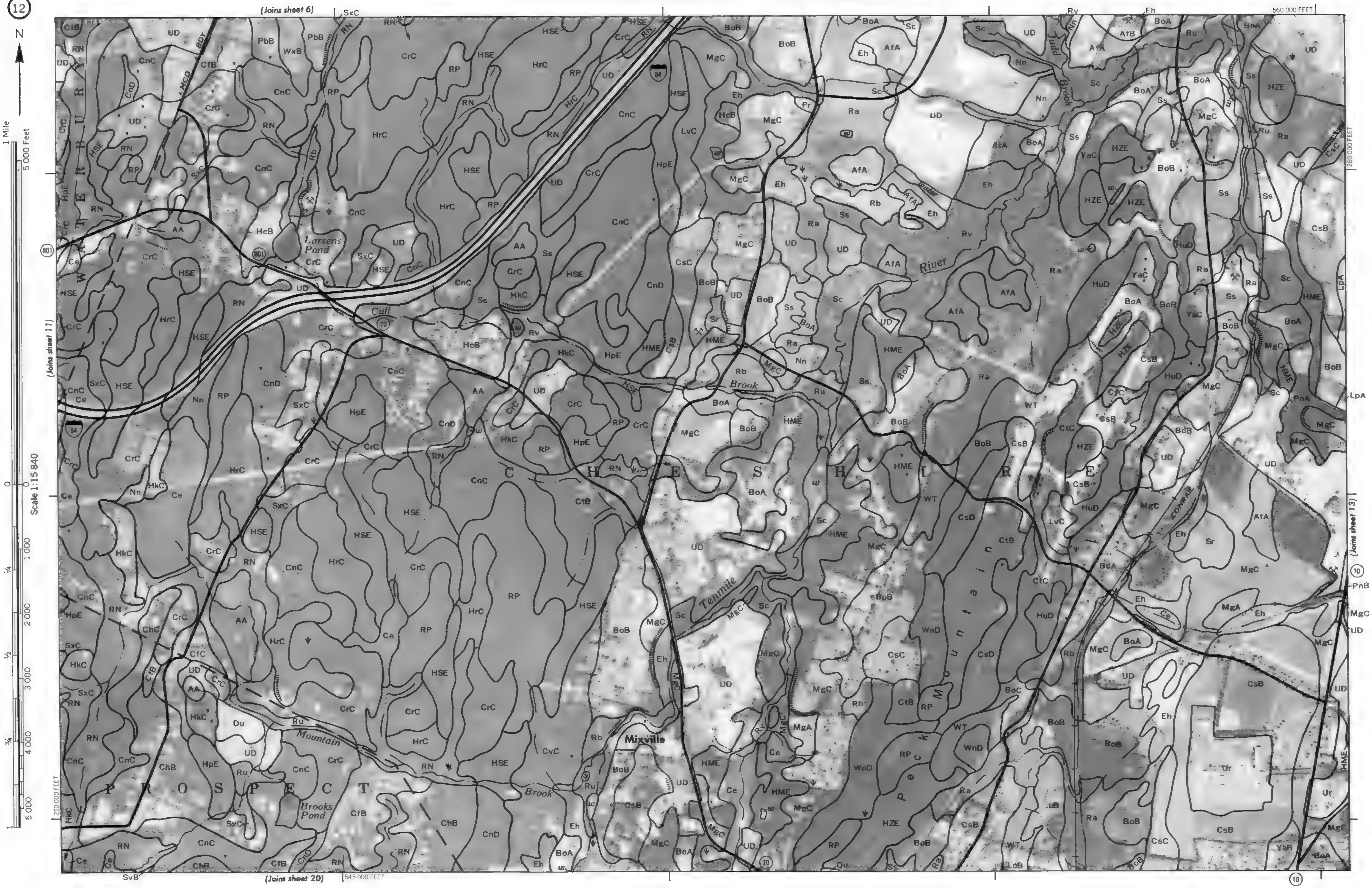
Scale 1:15 840

1 Mile

5 000 Feet

0 ¼ ½ ¾ 1

0 1000 2000 3000 4000 5000



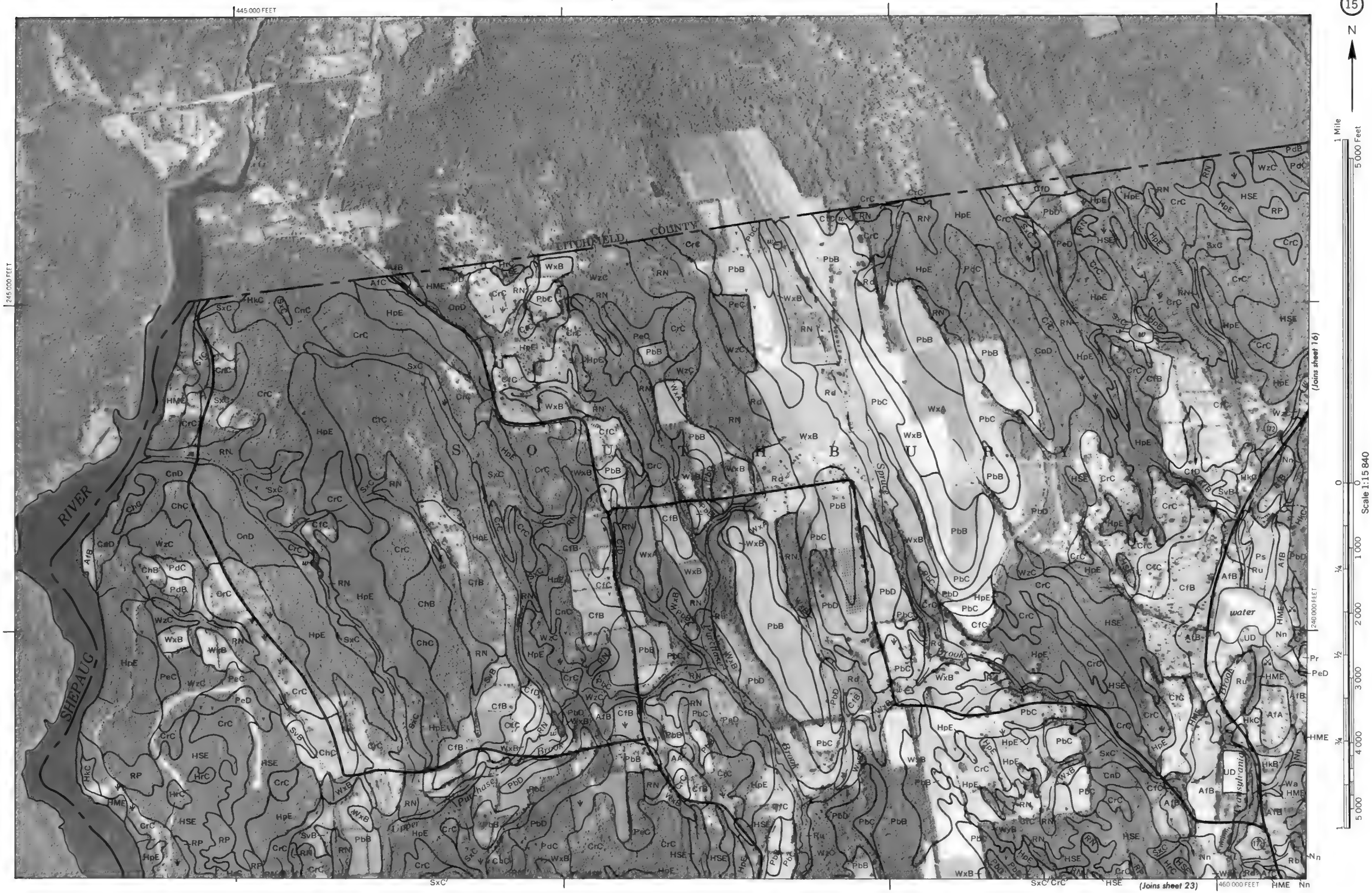
This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

NEW HAVEN COUNTY, CONNECTICUT NO. 12

NEW HAVEN COUNTY, CONNECTICUT NO. 13

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

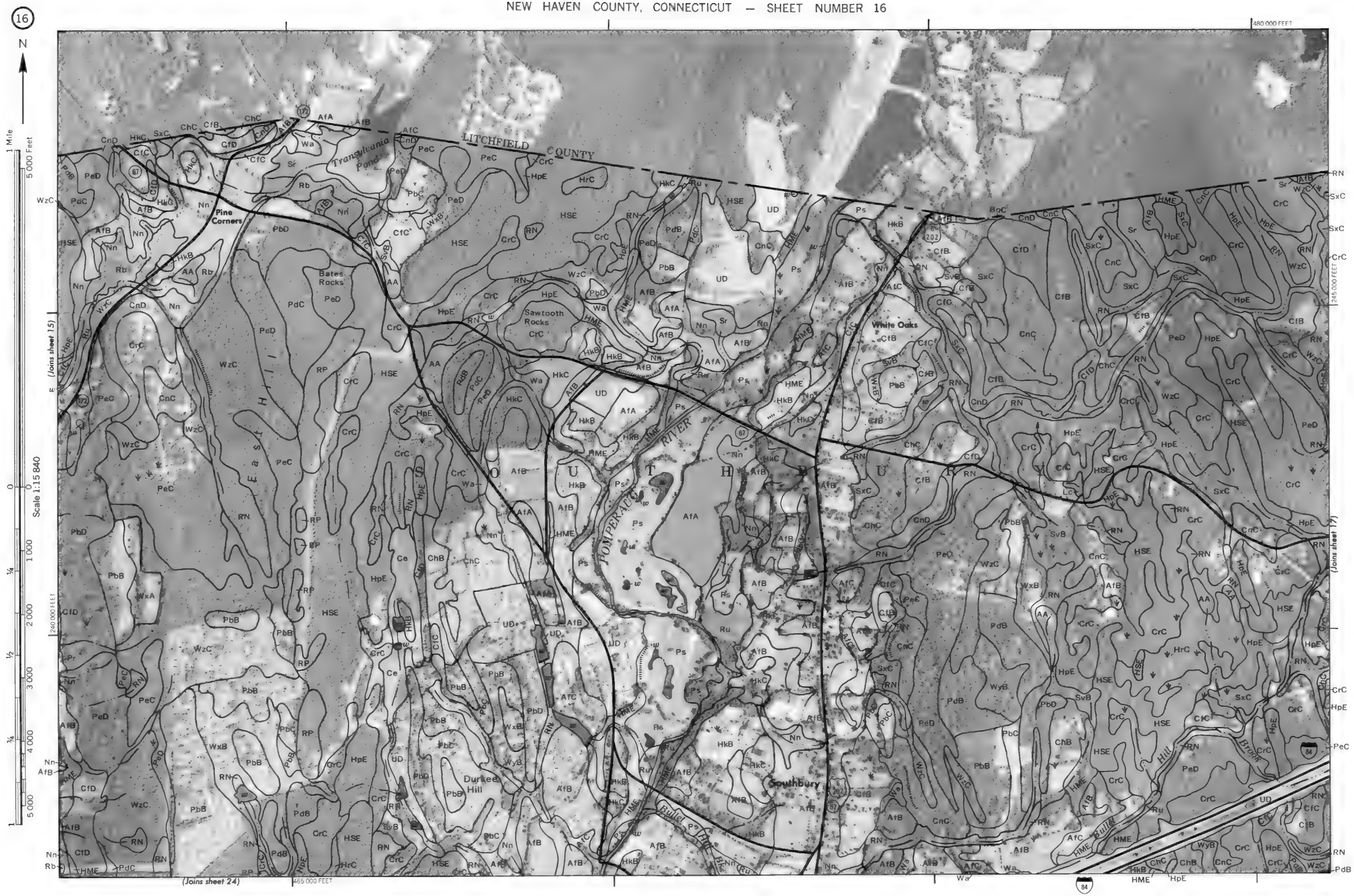
This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



NEW HAVEN COUNTY, CONNECTICUT NO. 15

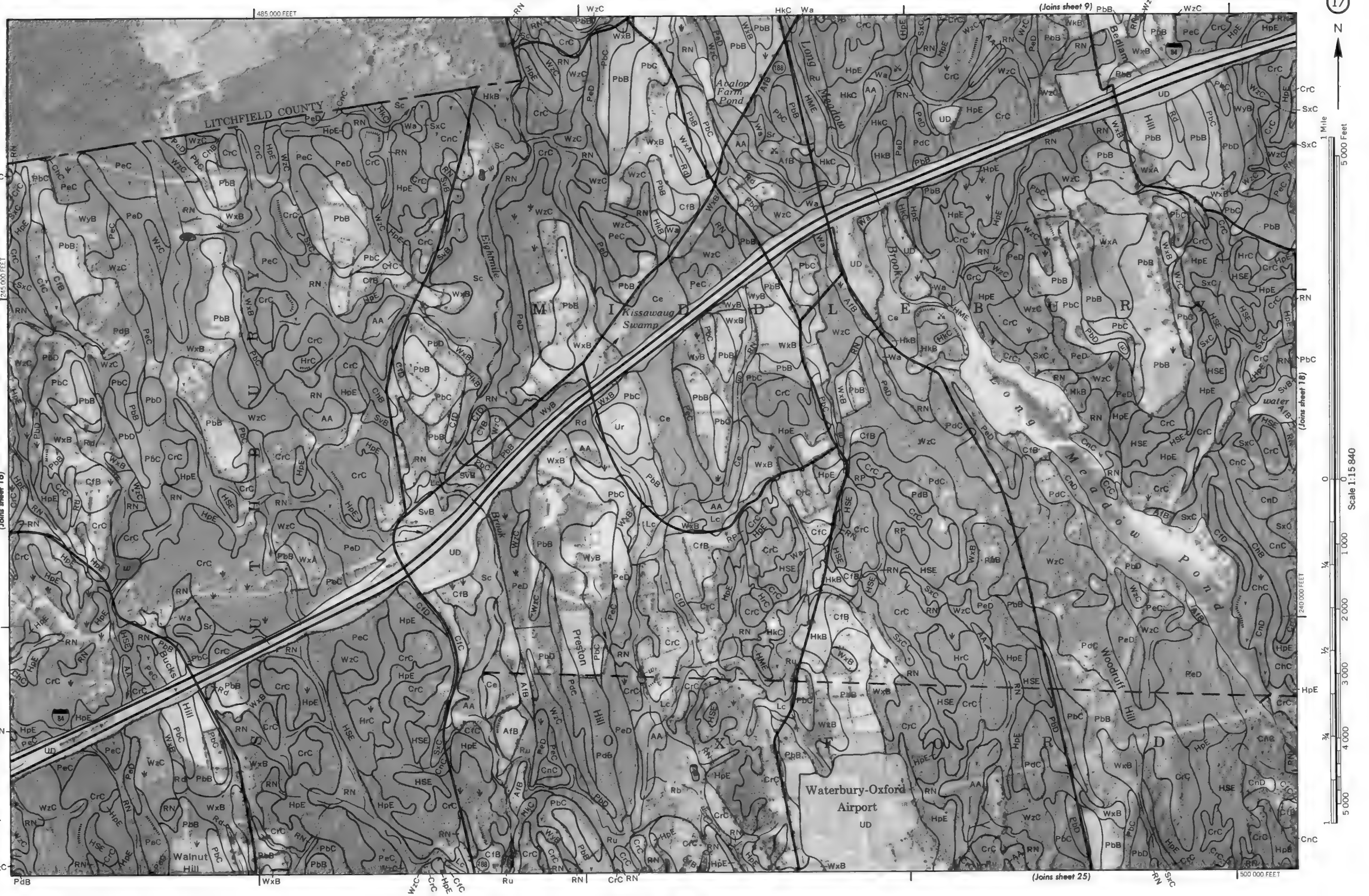
This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

NEW HAVEN COUNTY, CONNECTICUT — SHEET NUMBER 16



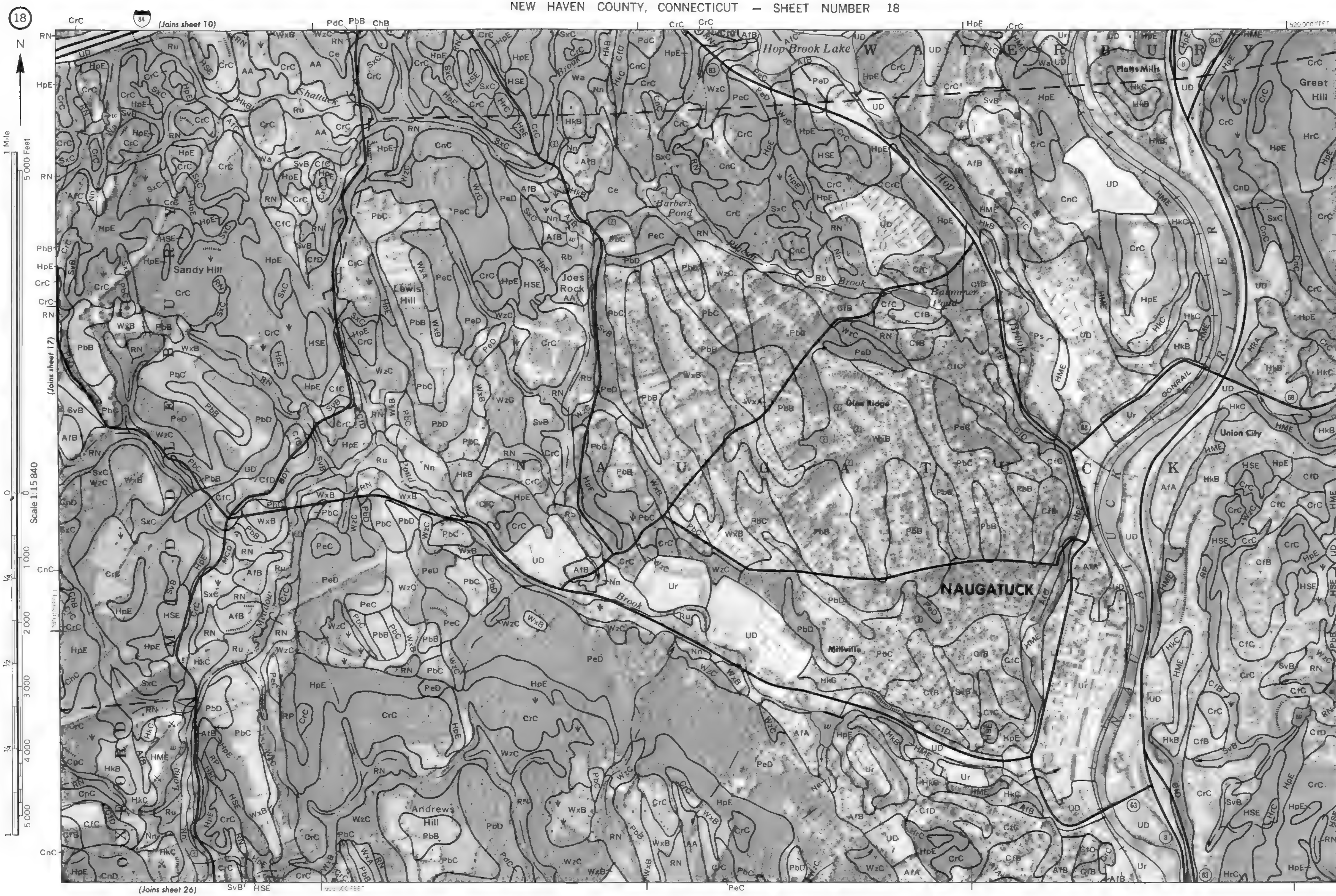
This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

NEW HAVEN COUNTY, CONNECTICUT NO. 16



NEW HAVEN COUNTY, CONNECTICUT NO. 17

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

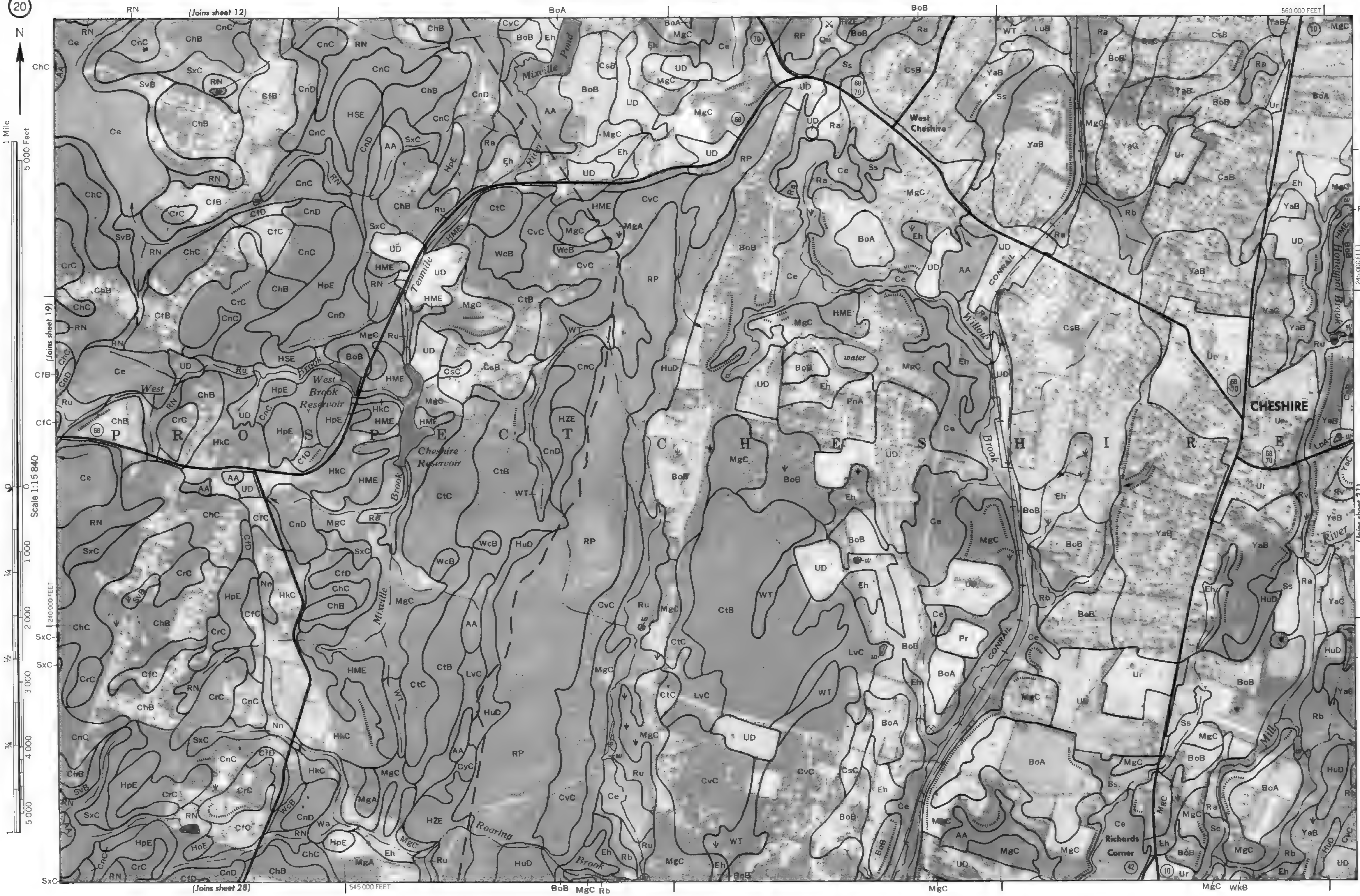


NEW HAVEN COUNTY, CONNECTICUT NO. 18

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

NEW HAVEN COUNTY, CONNECTICUT NO. 19

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned



This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

NEW HAVEN COUNTY, CONNECTICUT NO. 20

NEW HAVEN COUNTY, CONNECTICUT NO. 21

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

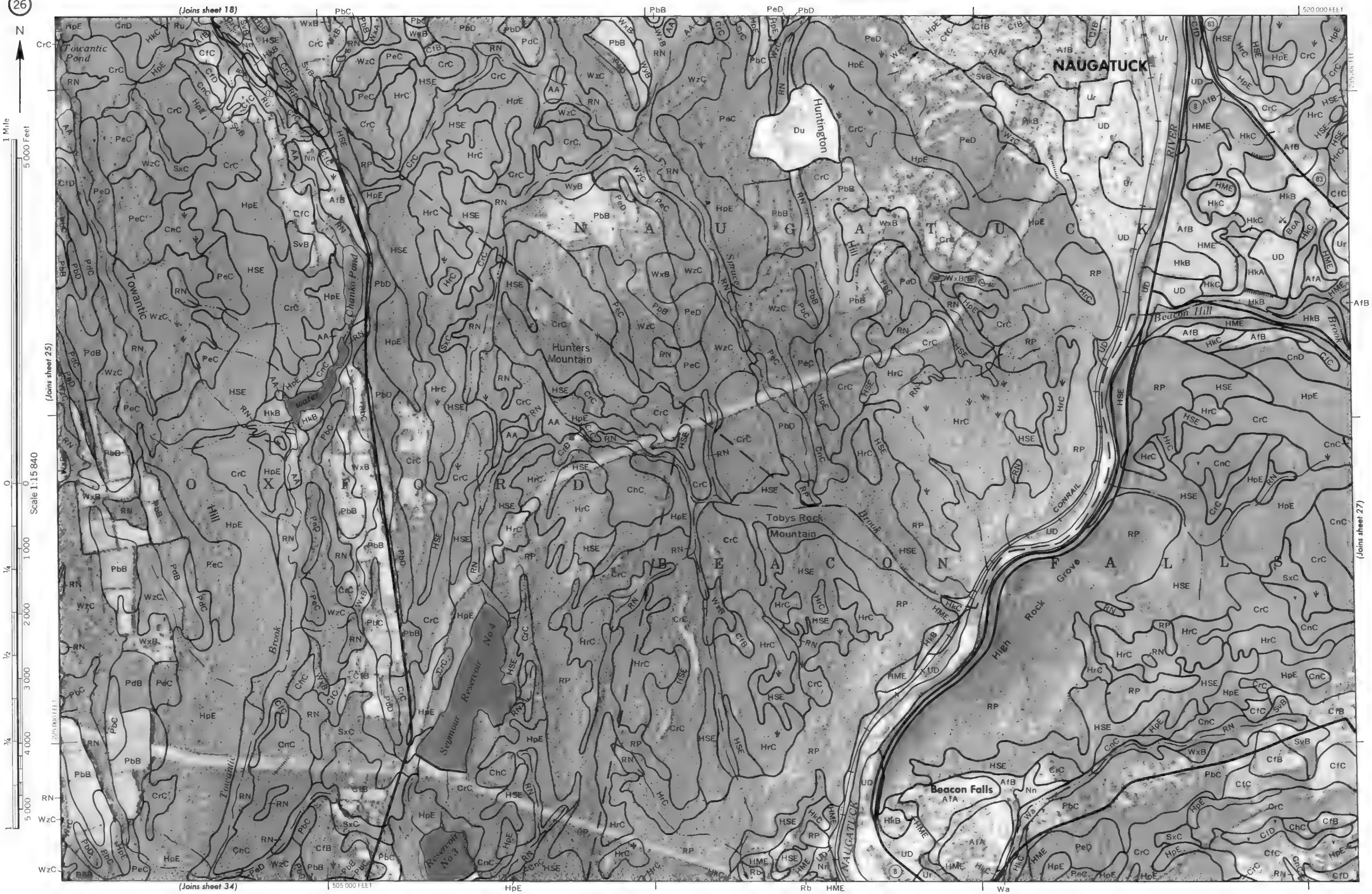
This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies.
Coordinate grid ticks and land division corners, if shown, are approximately positioned.

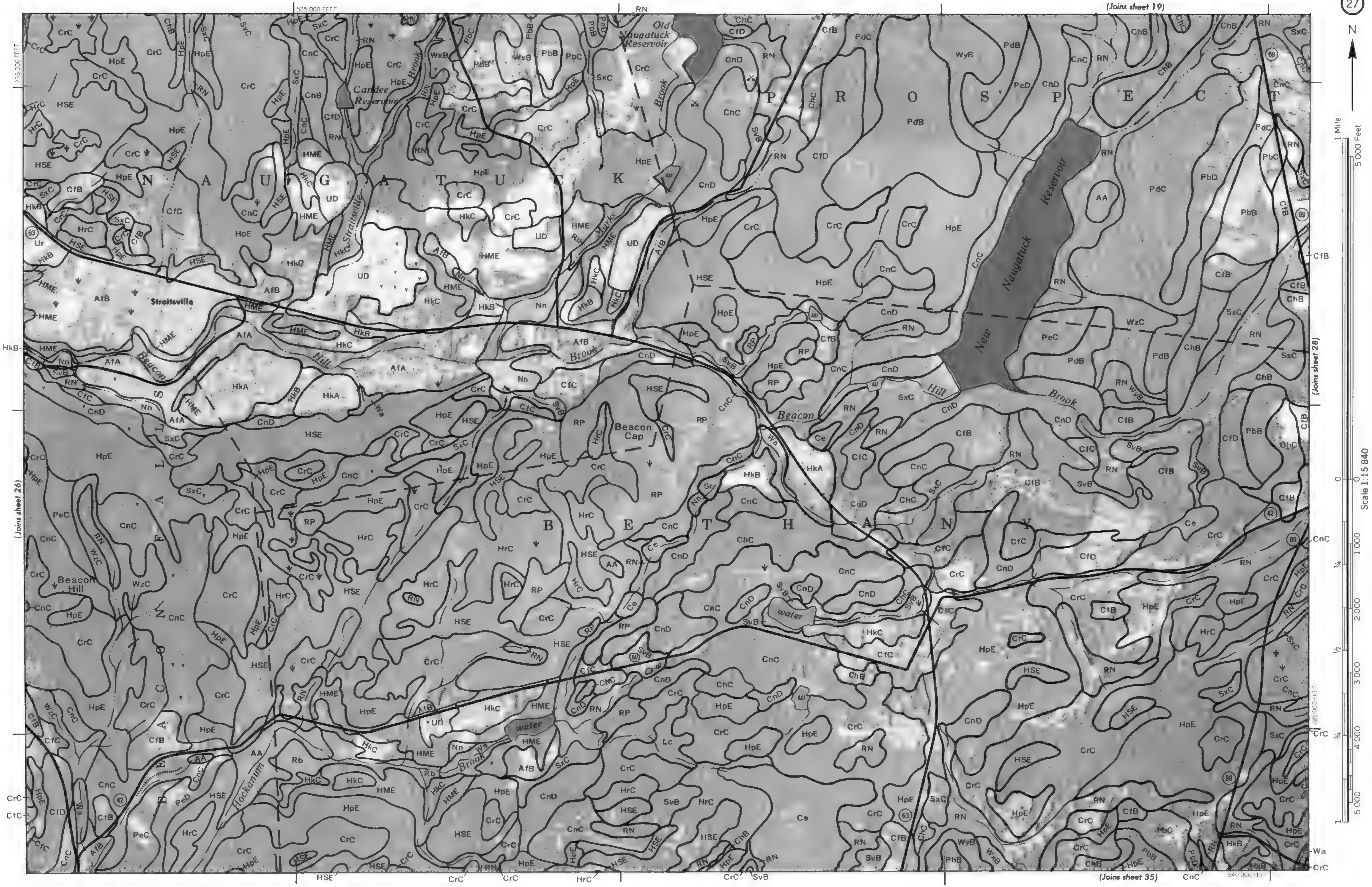
NEW HAVEN COUNTY, CONNECTICUT NO. 25

This map is compiled on 1975 aerial photography by the U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



NEW HAVEN COUNTY, CONNECTICUT NO. 26

NEW HAVEN COUNTY, CONNECTICUT — SHEET NUMBER 27



NEW HAVEN COUNTY, CONNECTICUT NO. 27

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

NEW HAVEN COUNTY, CONNECTICUT NO. 28

NEW HAVEN COUNTY, CONNECTICUT NO. 29

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

NEW HAVEN COUNTY, CONNECTICUT — SHEET NUMBER 30

N

1 Mile

5 000 Feet

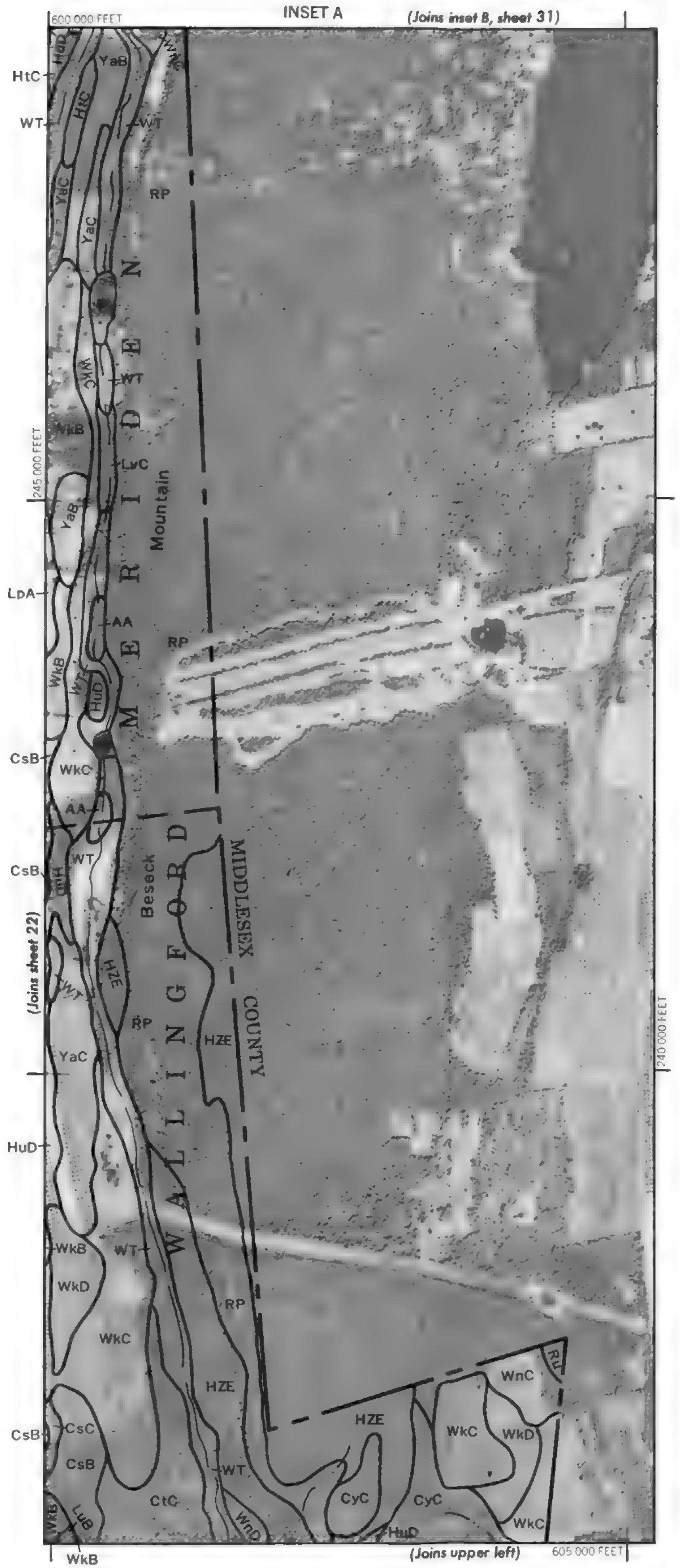
Scale 1:15 840

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

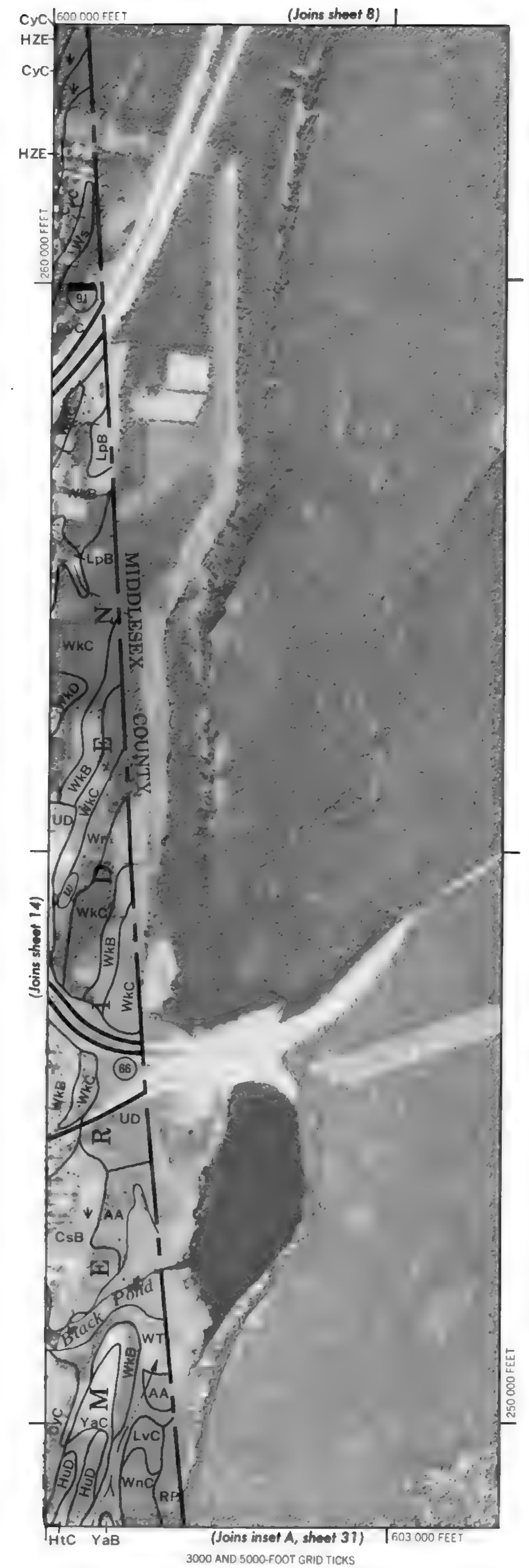
NEW HAVEN COUNTY, CONNECTICUT NO. 30

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

INSET A



INSET B

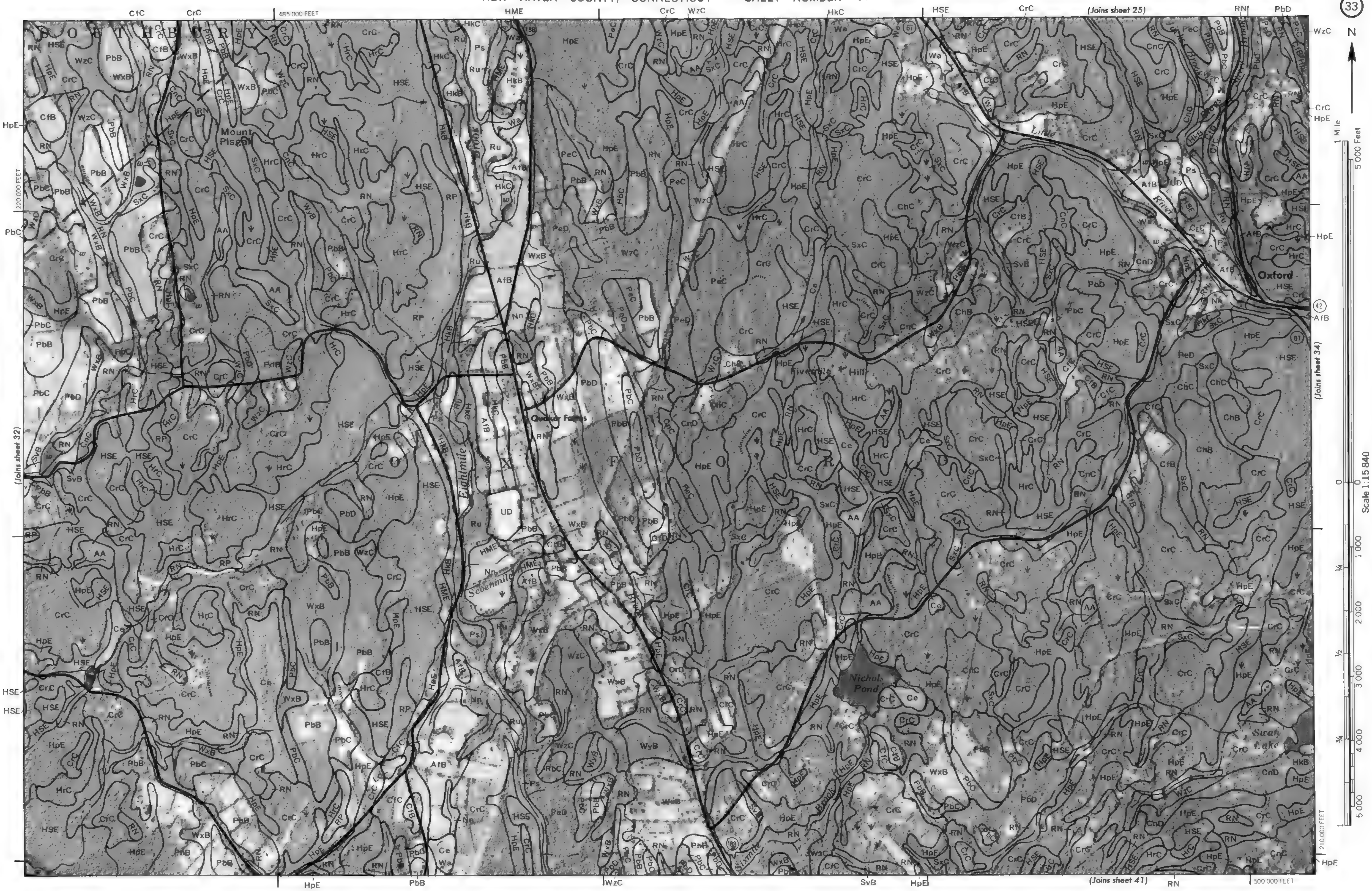


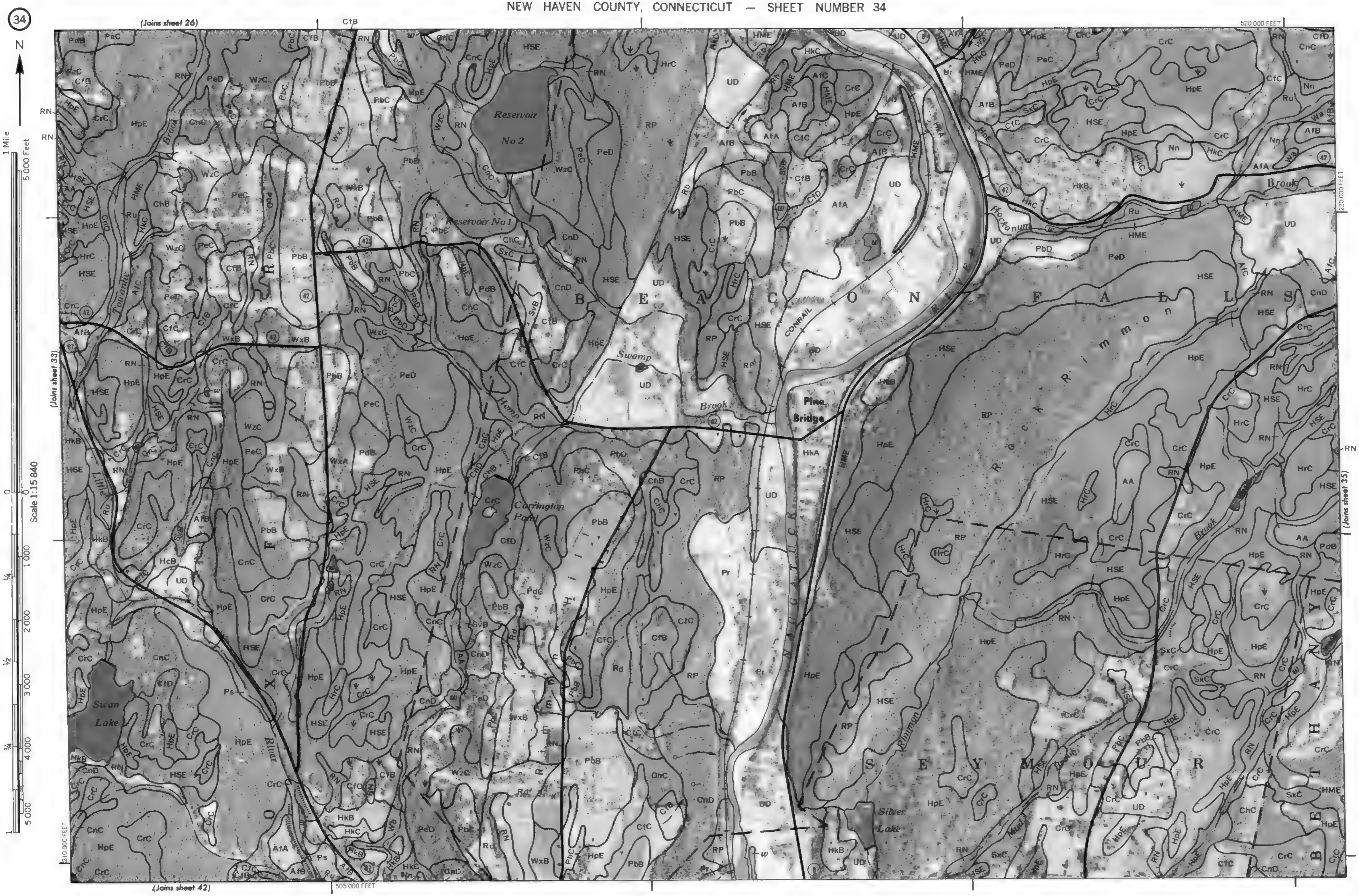
3000 AND 5000-FOOT GRID TICKS

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

NEW HAVEN COUNTY, CONNECTICUT NO. 32

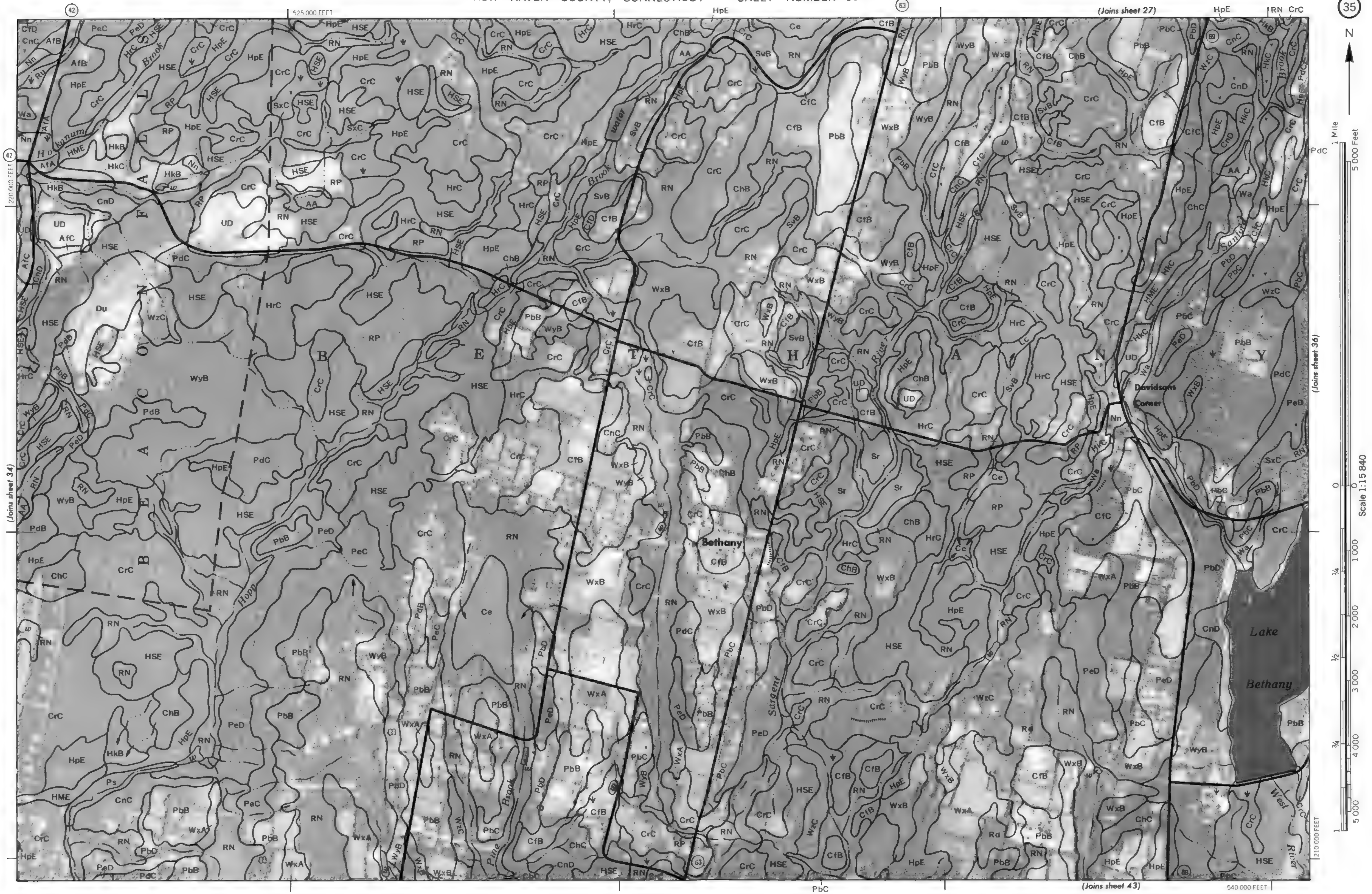
NEW HAVEN COUNTY, CONNECTICUT — SHEET NUMBER 33





NEW HAVEN COUNTY, CONNECTICUT NO. 34

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

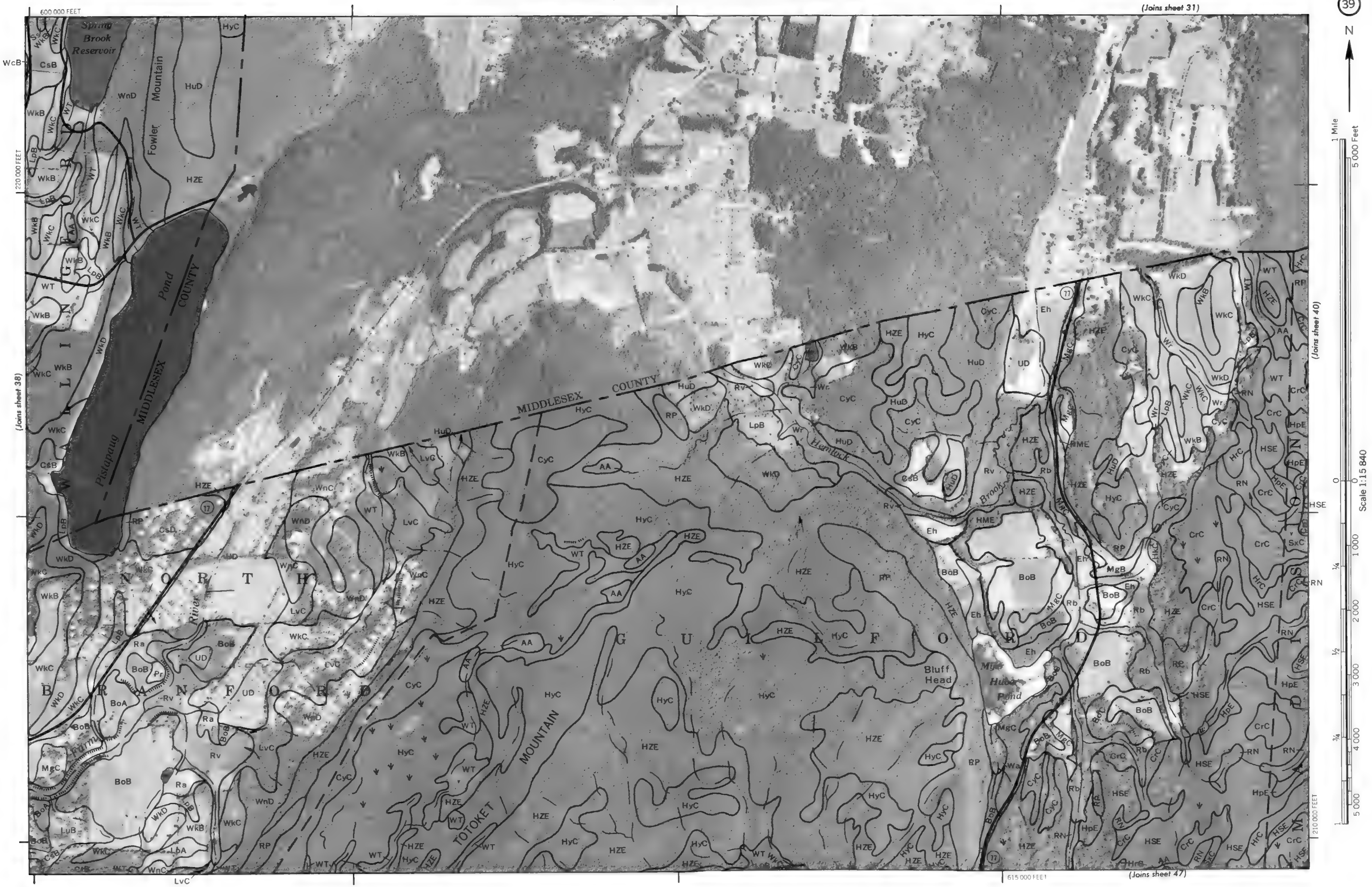
This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

NEW HAVEN COUNTY, CONNECTICUT NO. 37

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

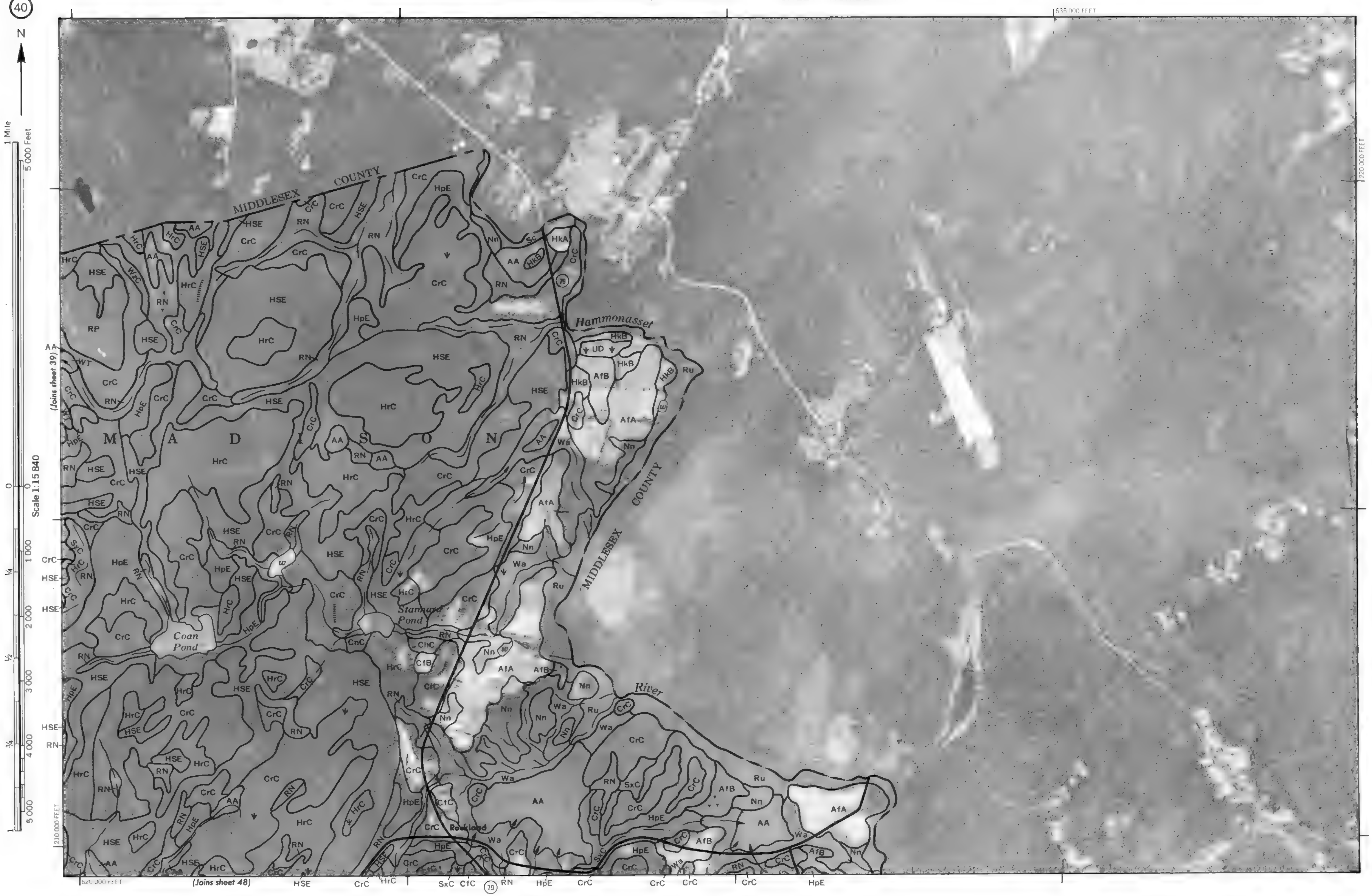
NEW HAVEN COUNTY, CONNECTICUT — SHEET NUMBER 38

NEW HAVEN COUNTY, CONNECTICUT NO. 38

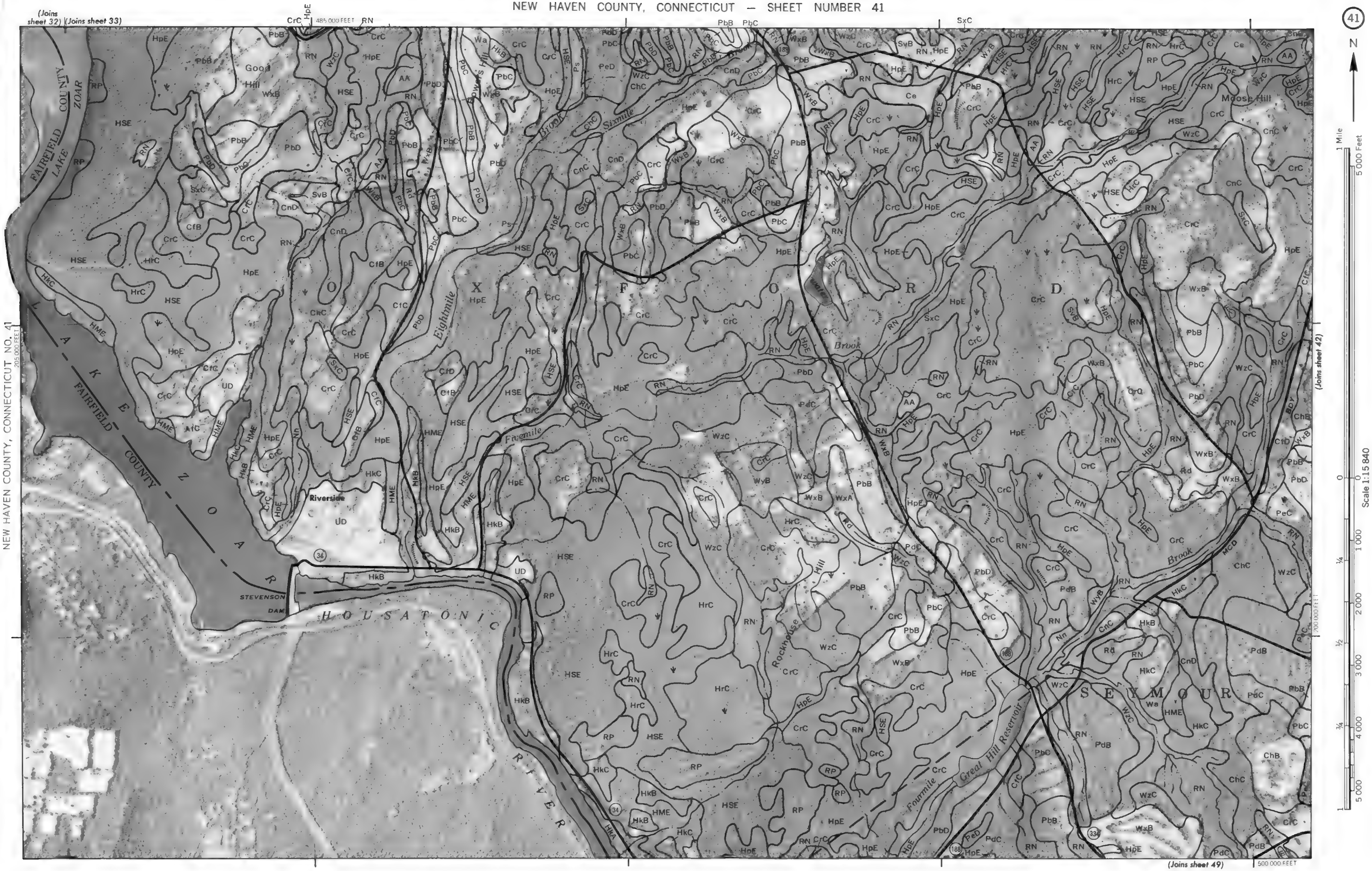


NEW HAVEN COUNTY, CONNECTICUT NO. 39

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies
Coordinate grid ticks and land division corners, if shown, are approximately positioned



This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies.
Coordinate grid ticks and land division corners, if shown, are approximately positioned.


(Joins sheet 32)
(Joins sheet 33)
(Joins sheet 42)
(Joins sheet 49)
41
N
1 Mile
5 000 Feet
Scale 1:15 840
485 000 FEET
500 000 FEET
205 000 FEET
200 000 FEET
NEW HAVEN COUNTY, CONNECTICUT NO. 41
O X F O R D
S E Y M O U R
H O U S A T O N I C R I V E R
L A K E Z O A R
FAIRFIELD COUNTY
Good Hill
Moose Hill
Riverside
STEVENSON DAM
Eightmile Brook
Sixmile Brook
Fourmile Brook
Rockhouse Hill
Great Hill Reservoir


42
N
(Joins sheet 34)
(Joins sheet 41)
(Joins sheet 43)
(Joins sheet 50)
1 Mile
5 000 Feet
Scale 1:15 840
520 000 FEET
205 000 FEET
200 000 FEET
505 000 FEET
O X F O R D
S E Y M O U R
B E T H A N Y
W O O D B R I D G E
SEYMOUR
BEACON FALLS
NAUGATUCK
RIVER
CONRAIL
Little River
Bladens River
Rimmon Brook
Mud Brook
Hopp Brook
Nickel Mine Brook
Steel Brook
Black Brook
Wooster Brook
Kinneytown Brook
Clarks Pond
Peat Swamp Reservoir
8
67
313
334

NEW HAVEN COUNTY, CONNECTICUT, NO. 43

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

NEW HAVEN COUNTY, CONNECTICUT NO. 44

This map is compiled on 1971 aerial photographs by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

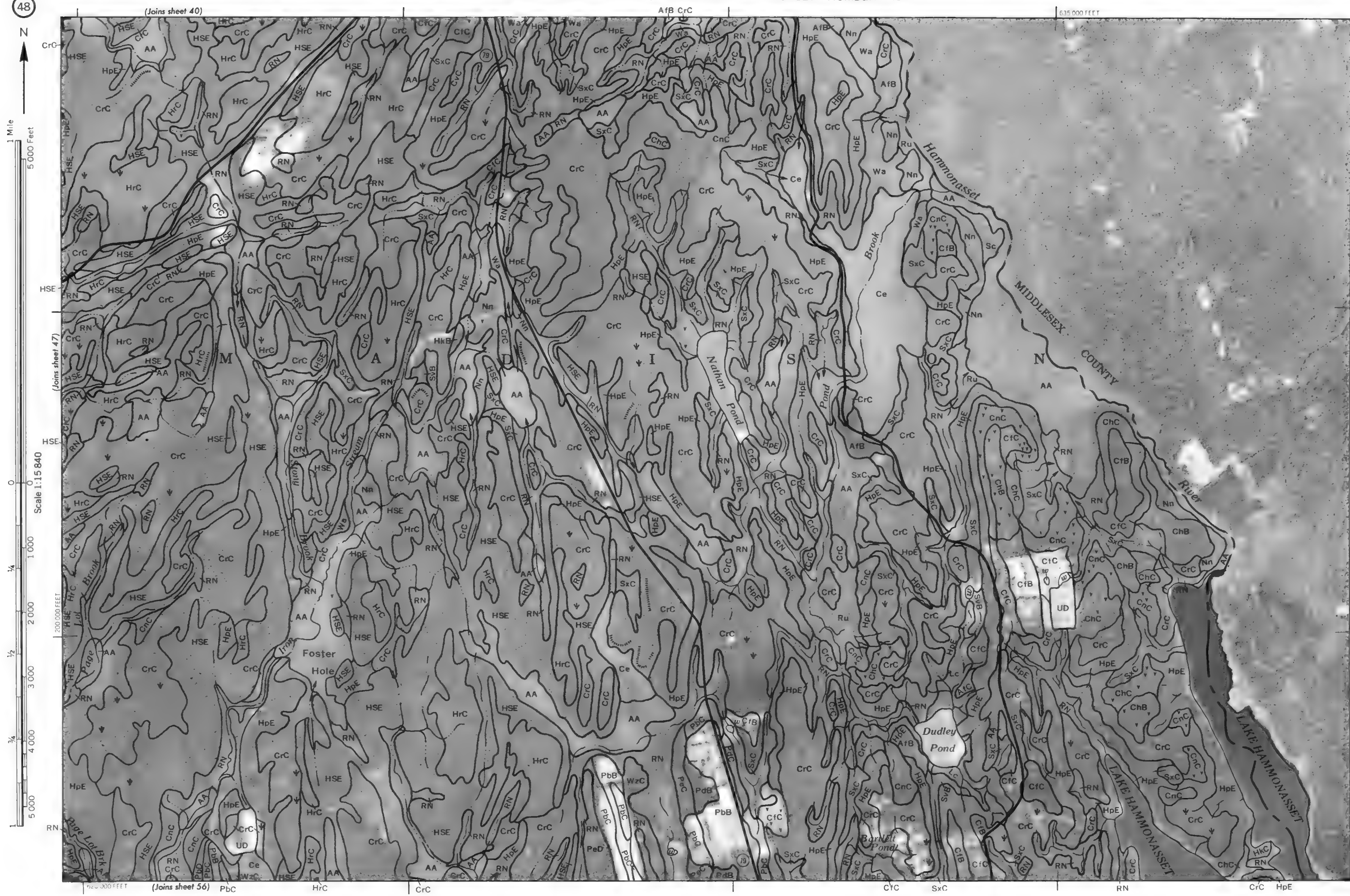
NEW HAVEN COUNTY, CONNECTICUT NO. 45

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

(Joins sheet 38)
(Joins sheet 45)
(Joins sheet 47)
(Joins sheet 54)
N
1 Mile
5 000 Feet
Scale 1:15 840
595 000 FEET
585 000 FEET
205 000 FEET
200 000 FEET
WALLINGFORD
NORTH HAVEN
NORTH BRANFORD
TOTOKET MOUNTAIN
Northford
Dayton Pond
Farm River
Pine River
Muddy River
Eightmile Brook
Gulf Brook
Farm River
Crooked Brook
Brook

NEW HAVEN COUNTY, CONNECTICUT NO. 47

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

NEW HAVEN COUNTY, CONNECTICUT, NO. 49

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

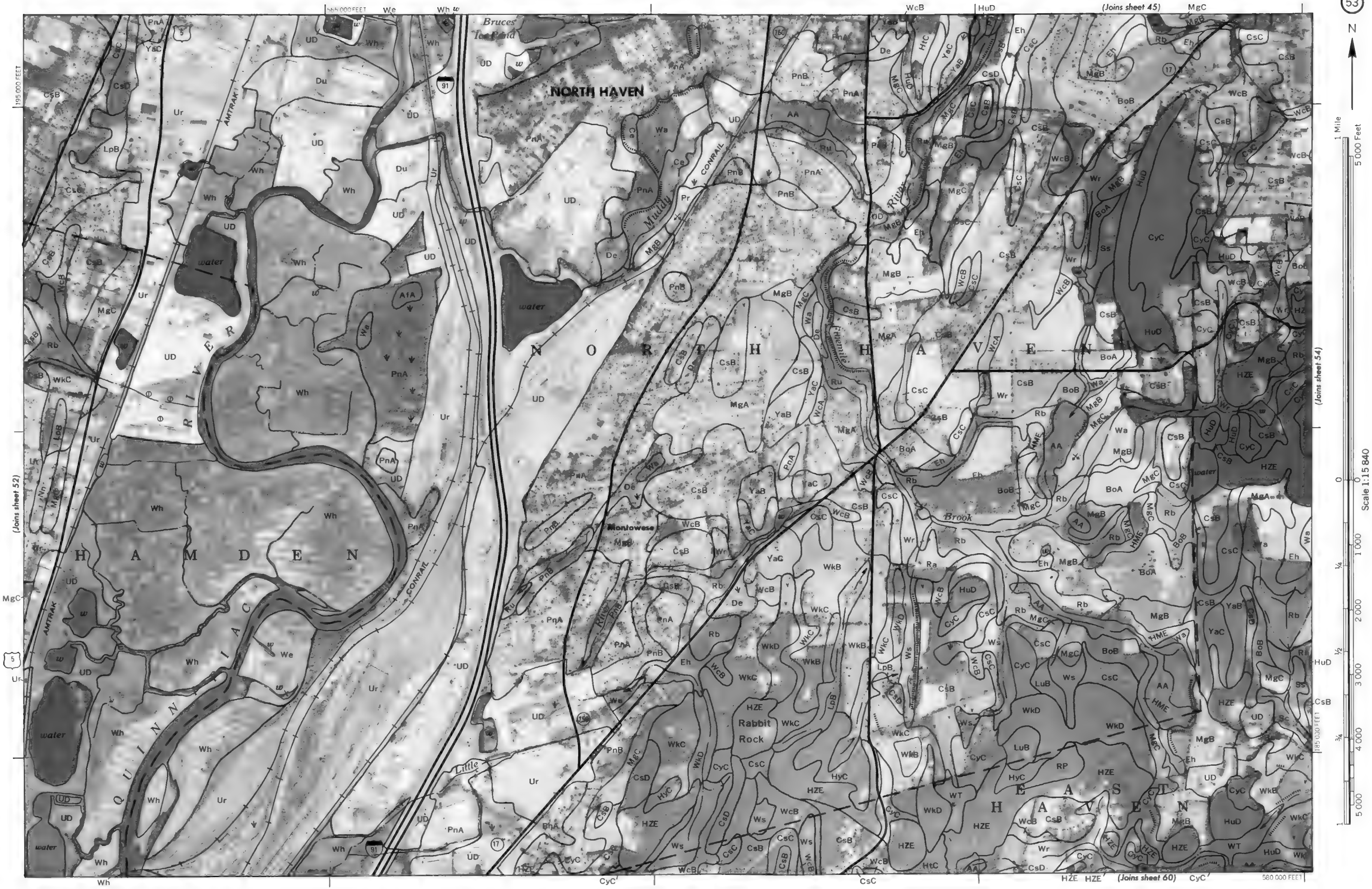
This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

NEW HAVEN COUNTY, CONNECTICUT NO. 50

NEW HAVEN COUNTY, CONNECTICUT NO. 51

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

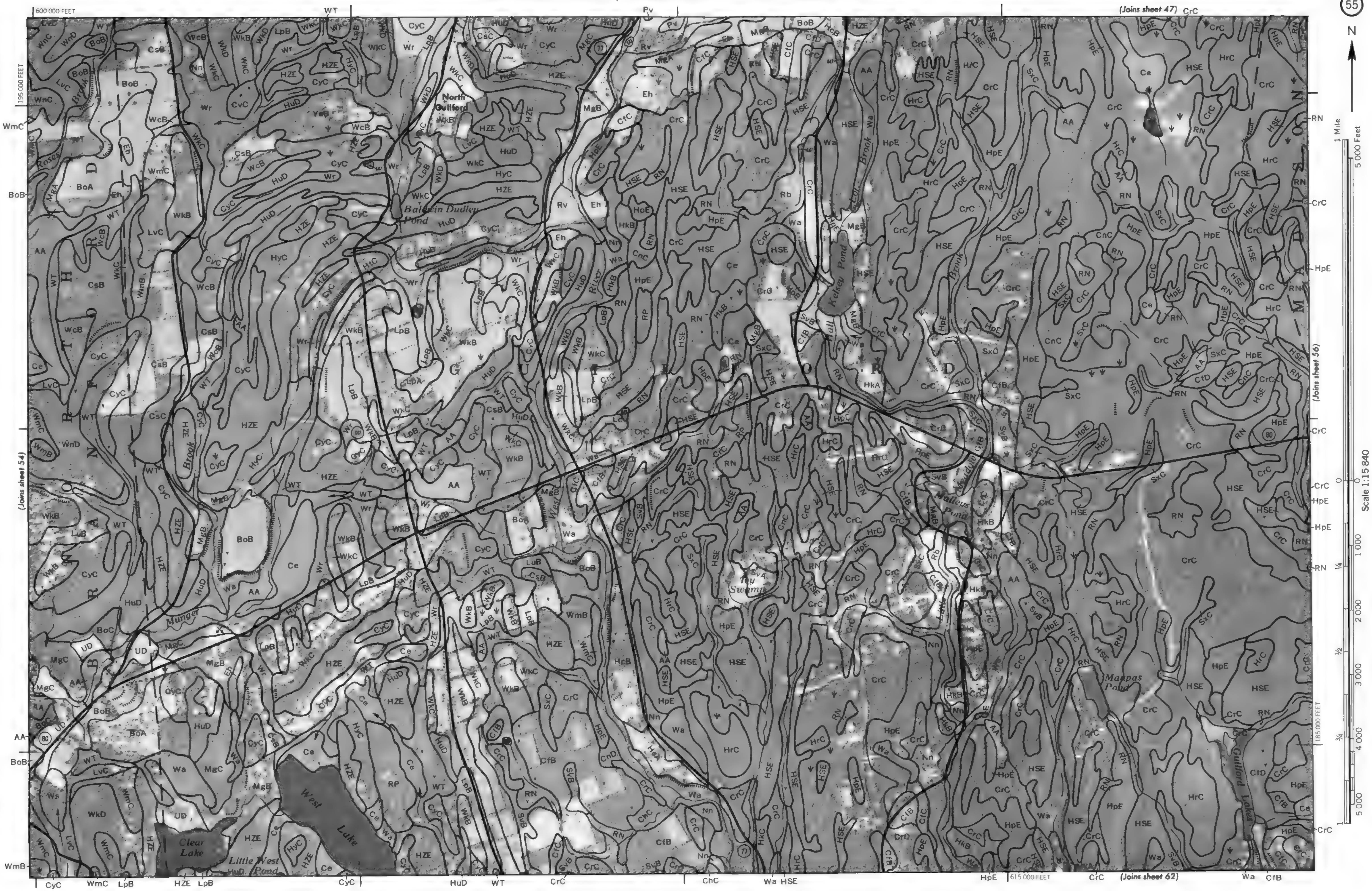
This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



NEW HAVEN COUNTY, CONNECTICUT NO. 53

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

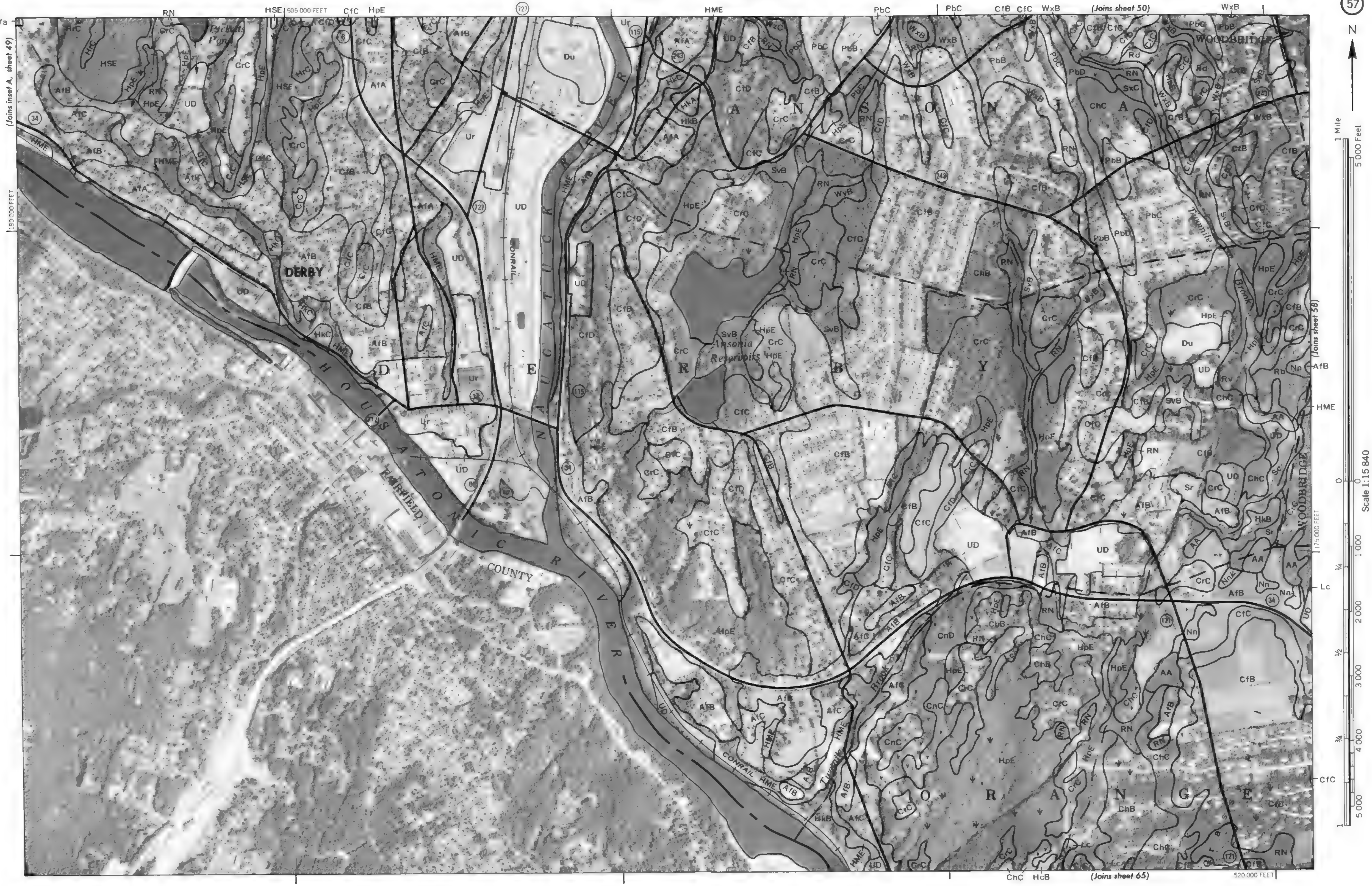
This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



NEW HAVEN COUNTY, CONNECTICUT NO. 55

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



NEW HAVEN COUNTY, CONNECTICUT NO. 57

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

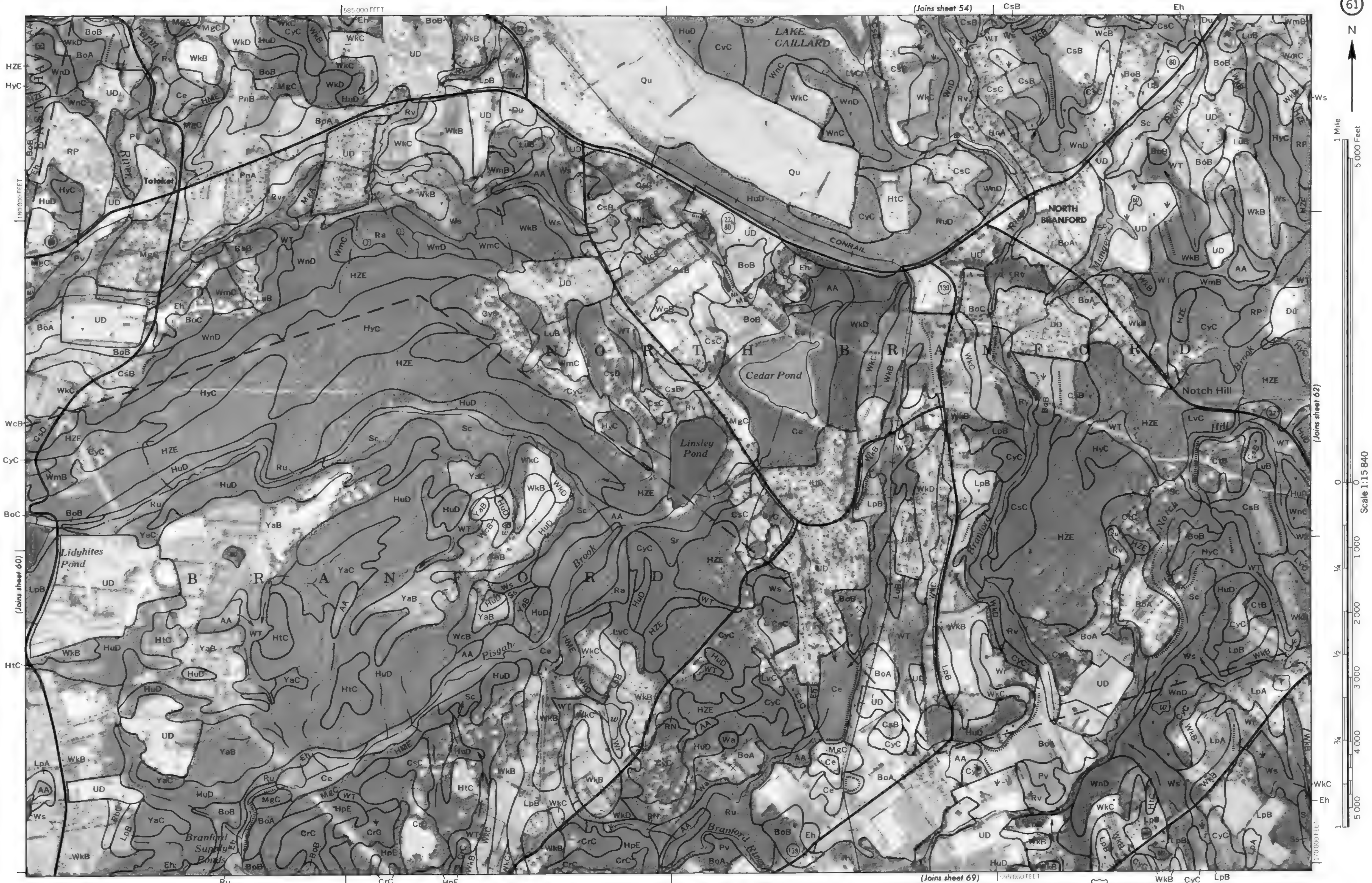
This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies.

NEW HAVEN COUNTY, CONNECTICUT — SHEET NUMBER 59

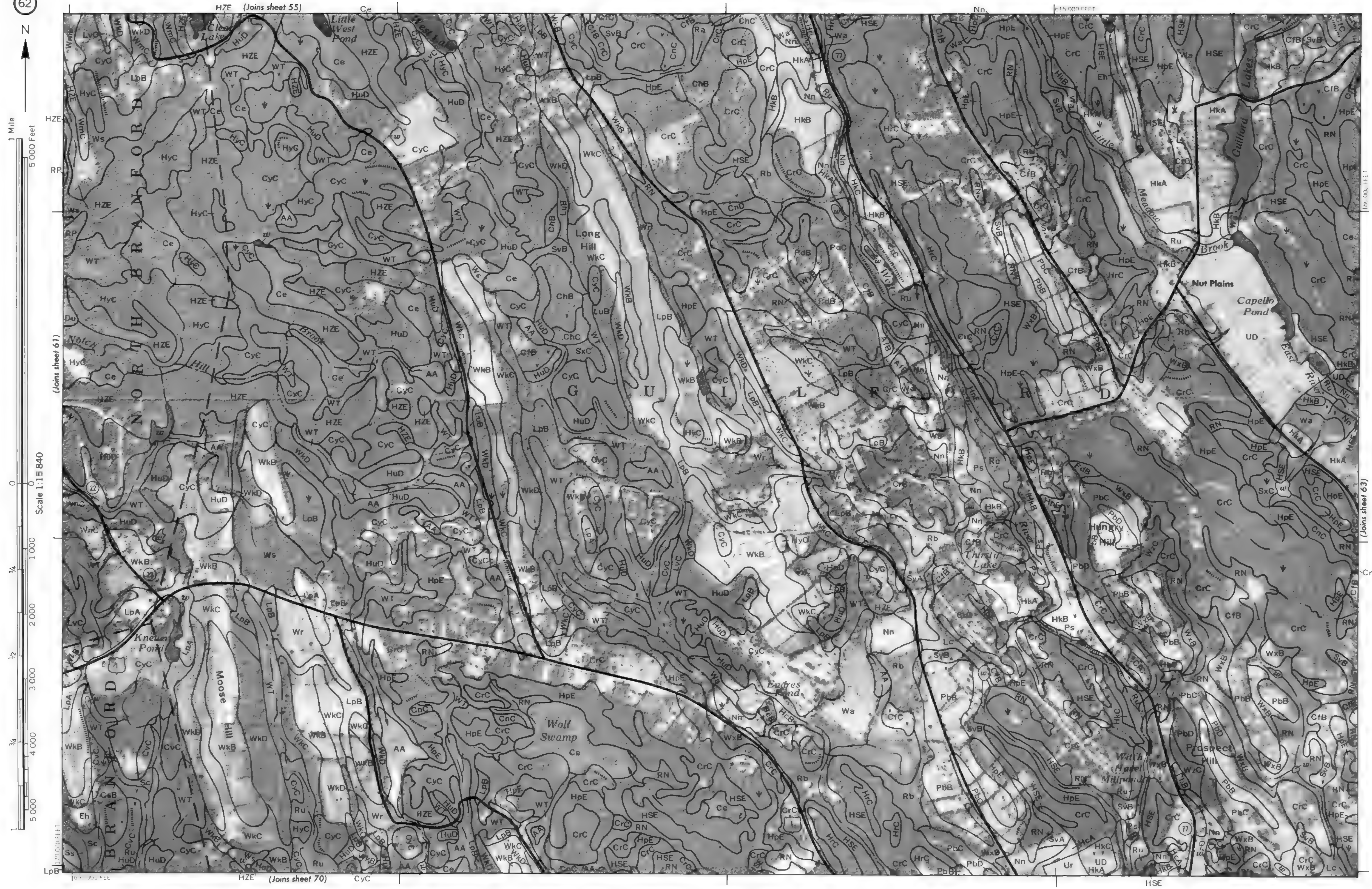
NEW HAVEN COUNTY, CONNECTICUT NO. 59

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

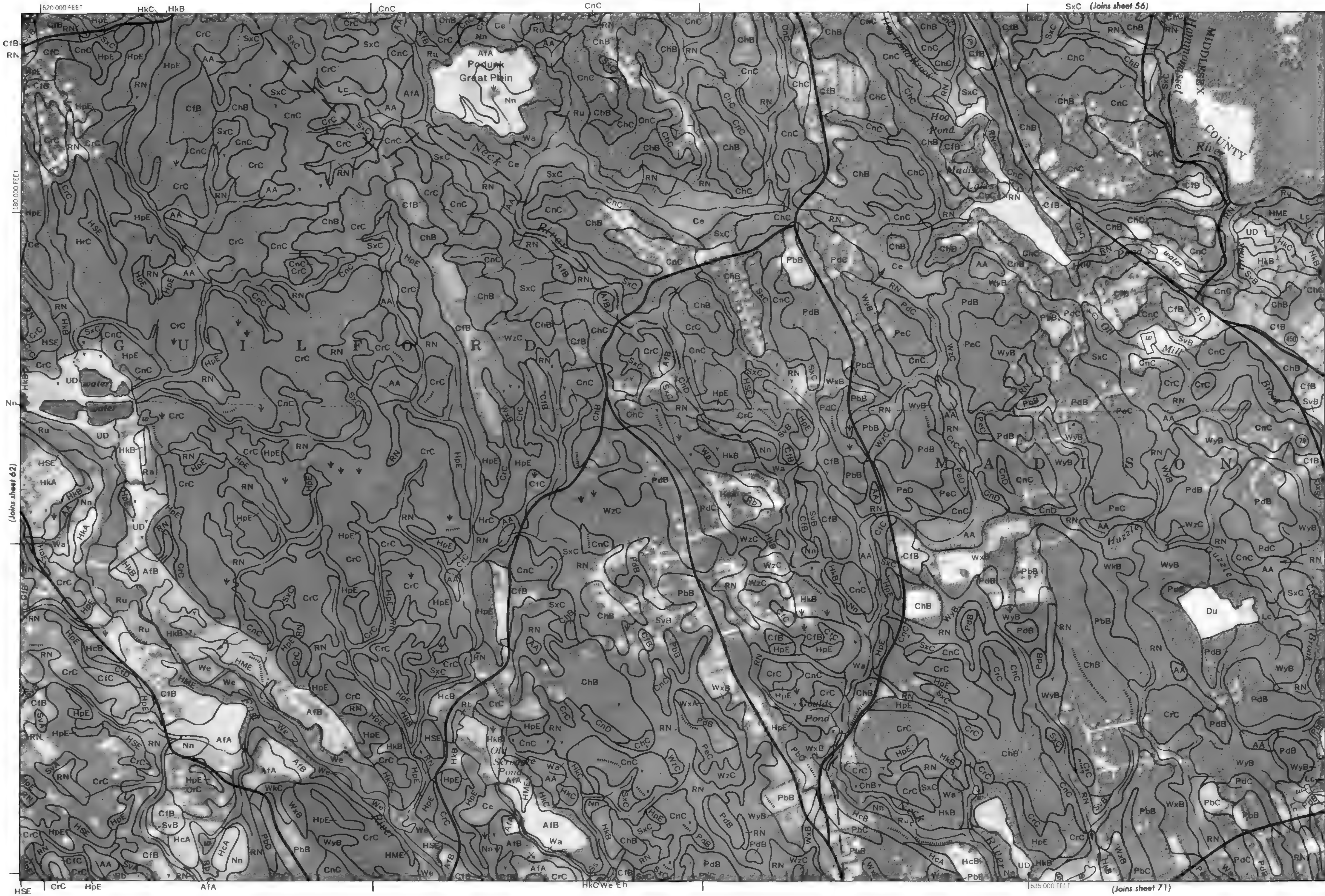

60
N
1 Mile
5 000 Feet
Scale 1:15 840
(Joins sheet 53)
(Joins sheet 59)
(Joins sheet 61)
(Joins sheet 68)
NORTH HAVEN
HAMDEN
NEW HAVEN
EAST HAVEN
NORTH BRANFORD
BRANFORD
QUINNIPIAC RIVER
Little River
Maloney Brook
Farm River
Foxon Pond
Foxon
Lidyhites Pond
Graniss Pond
SALTONSTALL RIDGE
LAKE SALTONSTALL
Fair Haven
Fair Haven East
CONRAIL
AMTRAK
water



NEW HAVEN COUNTY, CONNECTICUT NO. 61
This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.


(Joins sheet 55)
(Joins sheet 61)
(Joins sheet 63)
(Joins sheet 70)
N
1 Mile
5 000 Feet
Scale 1:15 840
NORTH BRANFORD
BRANFORD
GUILFORD
Long Hill
Nut Plains
Capello Pond
Hungry Hill
Thirsty Lake
Wolf Swamp
Moose Hill
Prospect Hill
Witch Hazel Millpond
Endres Pond
Kneuer Pond
Little West Pond
Clear Lake
Guilford Lakes
Notch Hill Brook
Meadow Brook
East River
NEW HAVEN COUNTY, CONNECTICUT NO. 62

63



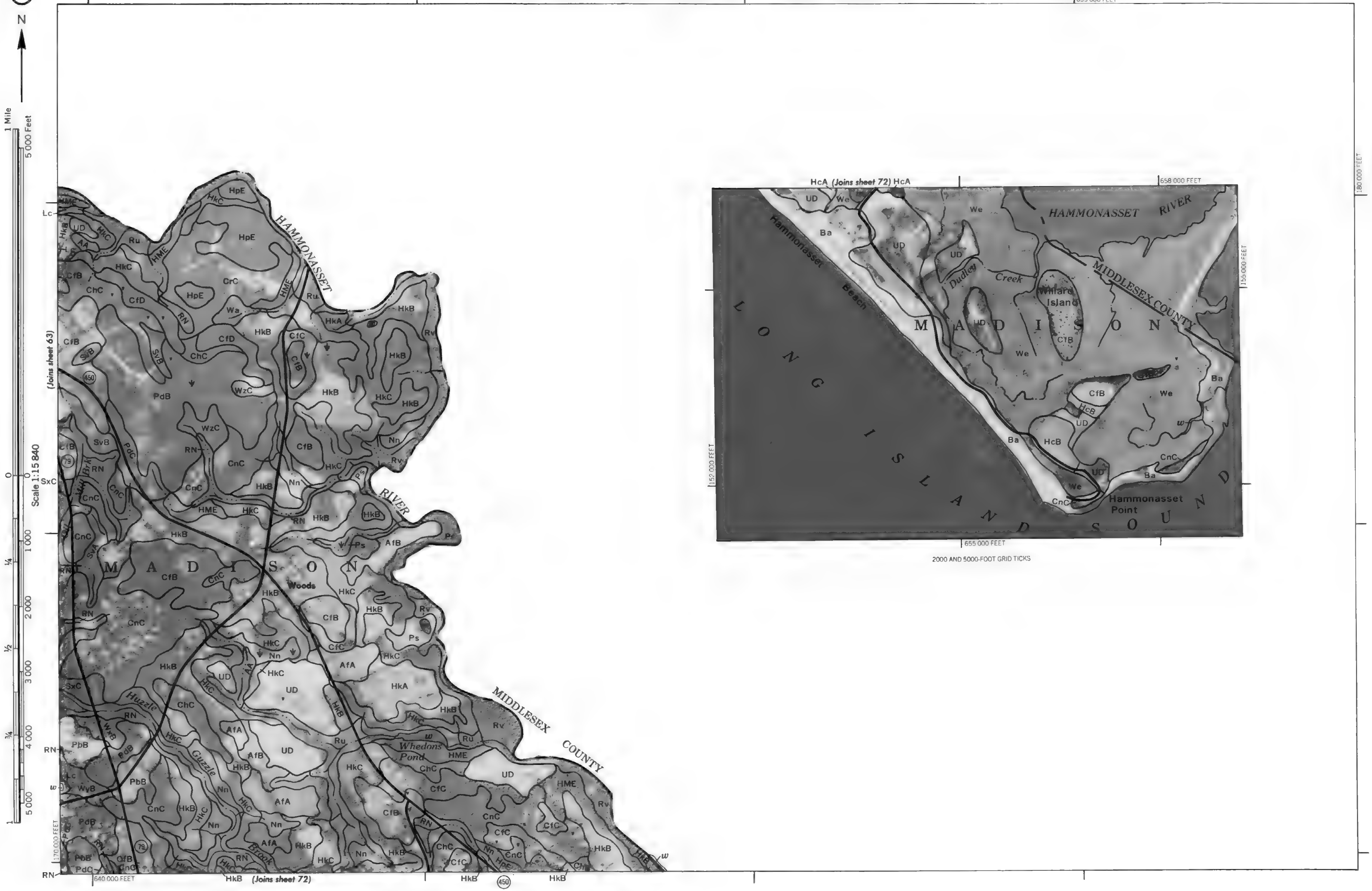
N

1 Mile
5 000 Feet
Scale 1:15 840

NEW HAVEN COUNTY, CONNECTICUT NO. 63

This map is compiled on 1973 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

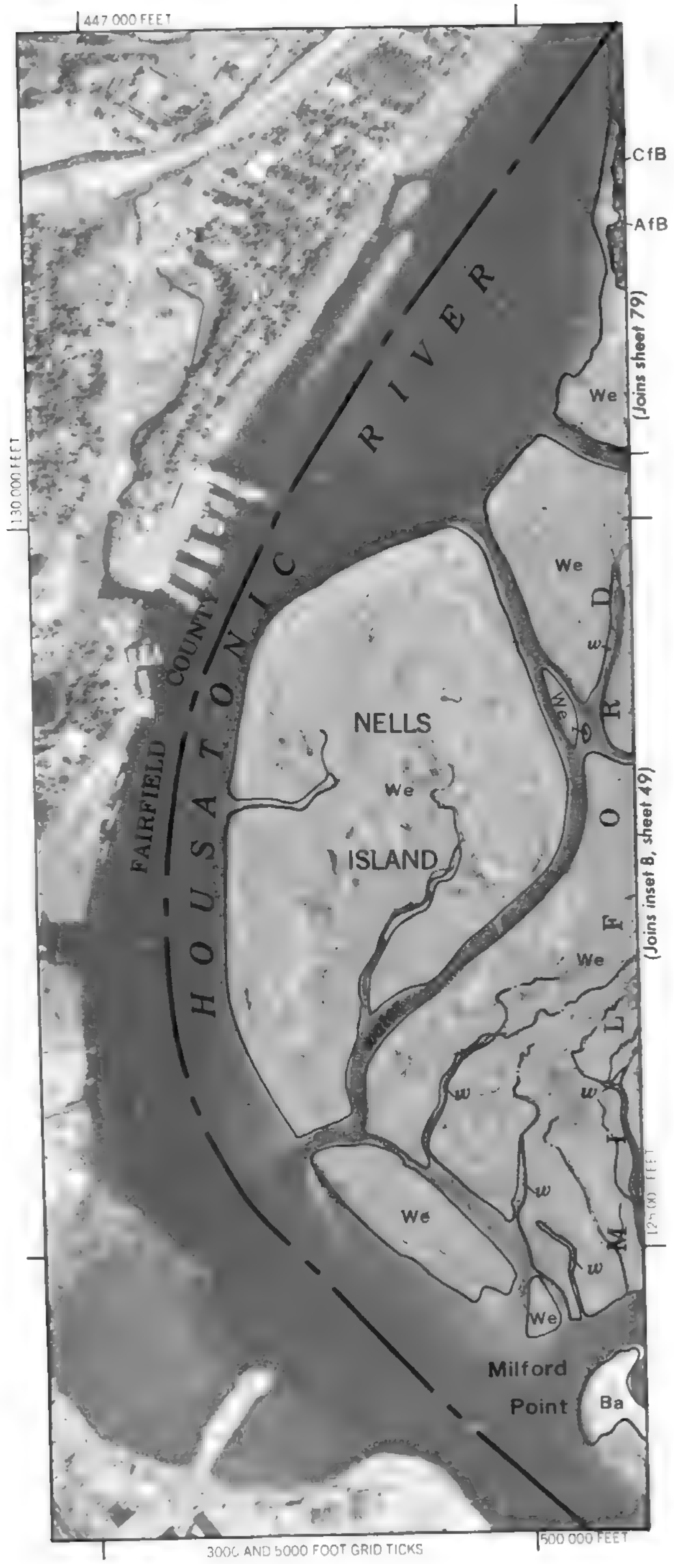
64



NEW HAVEN COUNTY, CONNECTICUT NO. 64

NEW HAVEN COUNTY, CONNECTICUT NO. 65

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



NEW HAVEN COUNTY, CONNECTICUT — SHEET NUMBER 66

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

NEW HAVEN COUNTY, CONNECTICUT NO. 66

NEW HAVEN COUNTY, CONNECTICUT NO. 67

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

NEW HAVEN COUNTY, CONNECTICUT — SHEET NUMBER 68

N

Scale 1:15 840

1 Mile

5 000 Feet

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

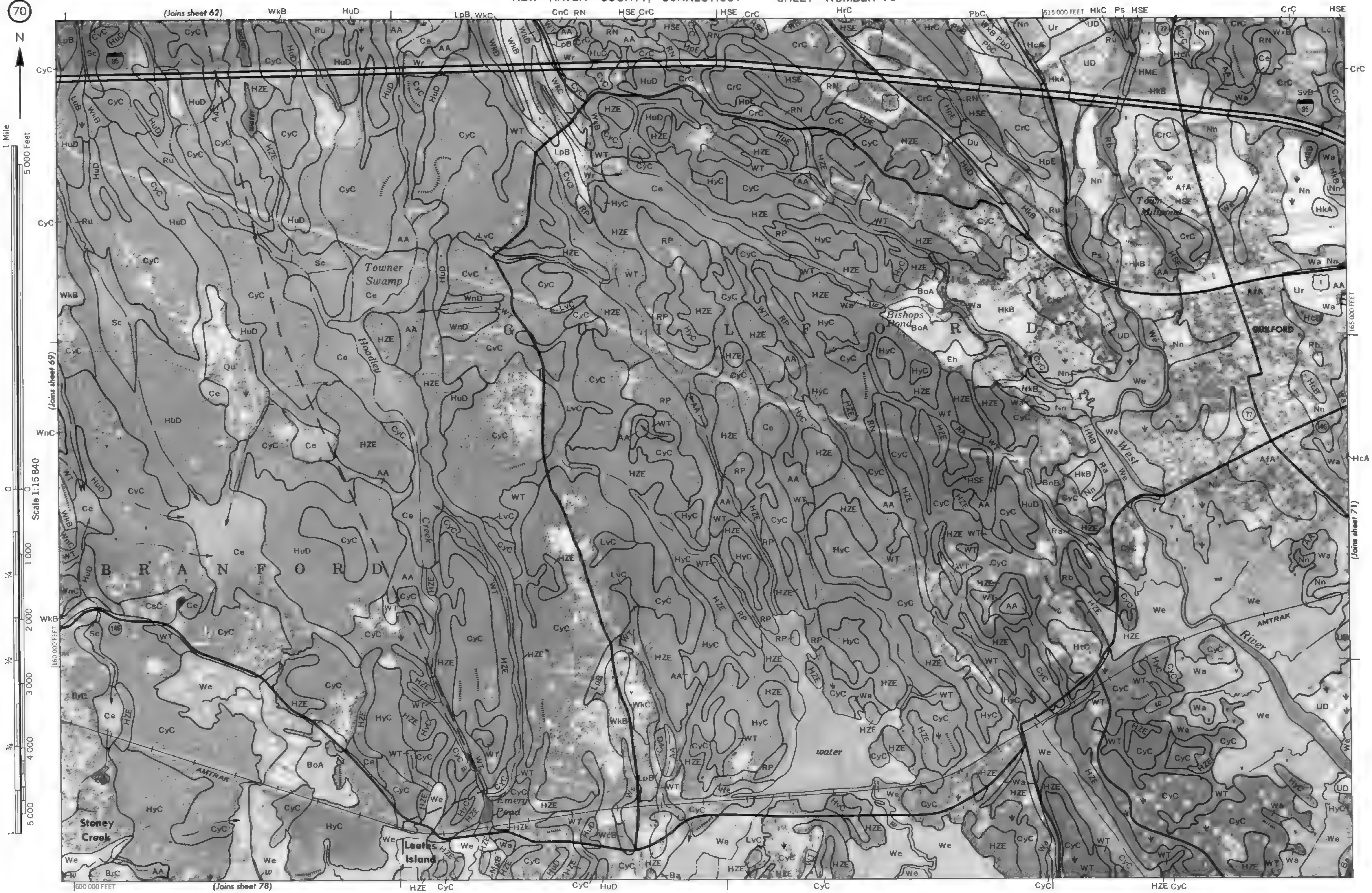
NEW HAVEN COUNTY, CONNECTICUT NO. 68

N

1 Mile — 5 000 Feet — Scale 1:15 840

NEW HAVEN COUNTY, CONNECTICUT NO. 69

This [redacted] compiled on 1975 aerial photography by [redacted] U. S. [redacted] of Agricul[redacted], Soil Conservation Service [redacted] cooperating agencies. [redacted] grid ticks and land division corners, if shown, are approximately positioned



This map is compiled on 1975 aerial photography by the U. S. [illegible]tment of [illegible]griculture Soil Con[illegible] Service [illegible]
Coordinate grid ticks and land division corners, if shown, are approximately positioned

NEW HAVEN COUNTY, CONNECTICUT — SHEET NUMBER 71

71

NEW HAVEN COUNTY, CONNECTICUT NO. 71

NEW HAVEN COUNTY, CONNECTICUT — SHEET NUMBER 72

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

NEW HAVEN COUNTY, CONNECTICUT NO. 72

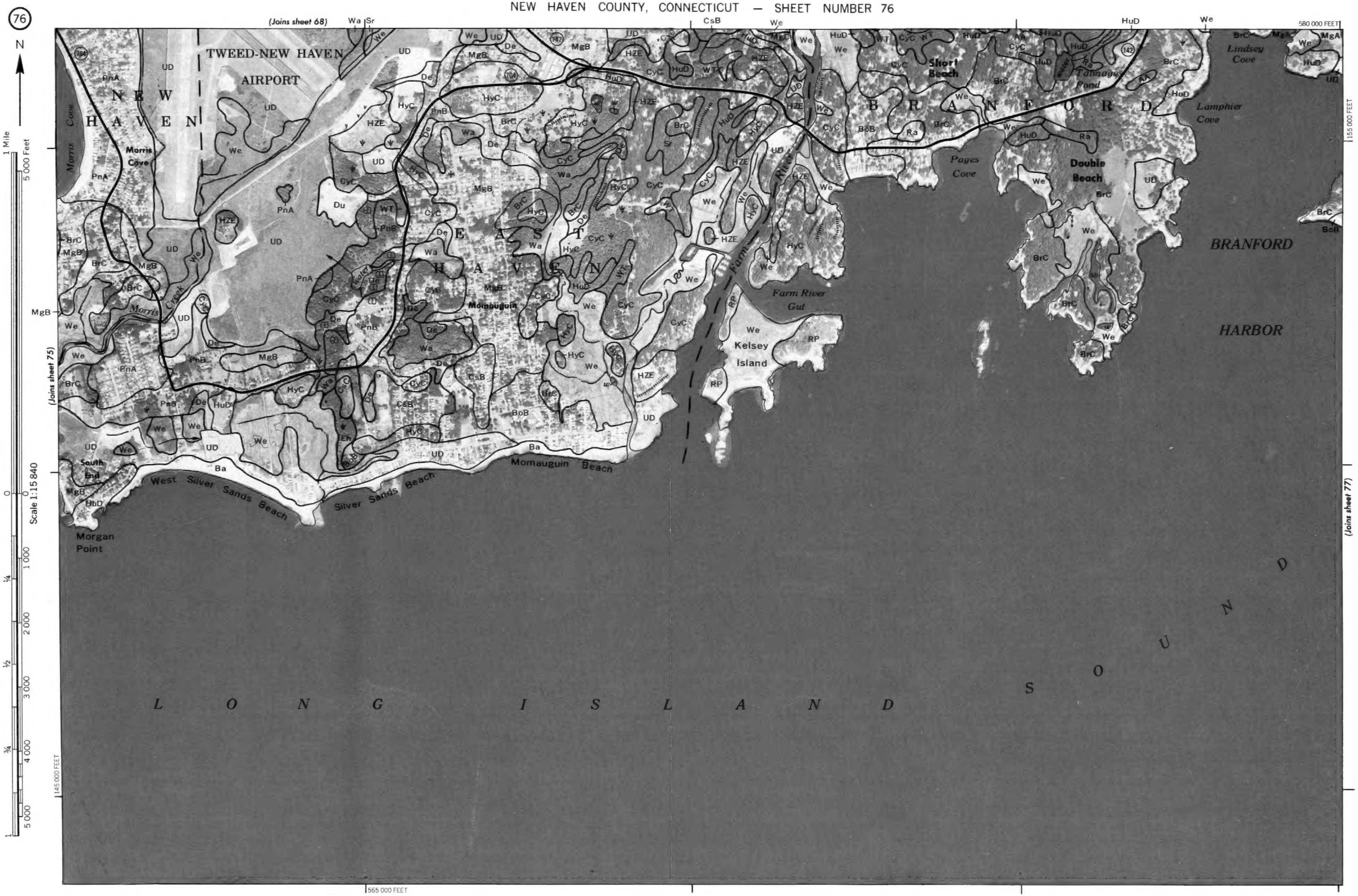
NEW HAVEN COUNTY, CONNECTICUT NO. 73

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land divisions corners, if shown, are approximately positioned.

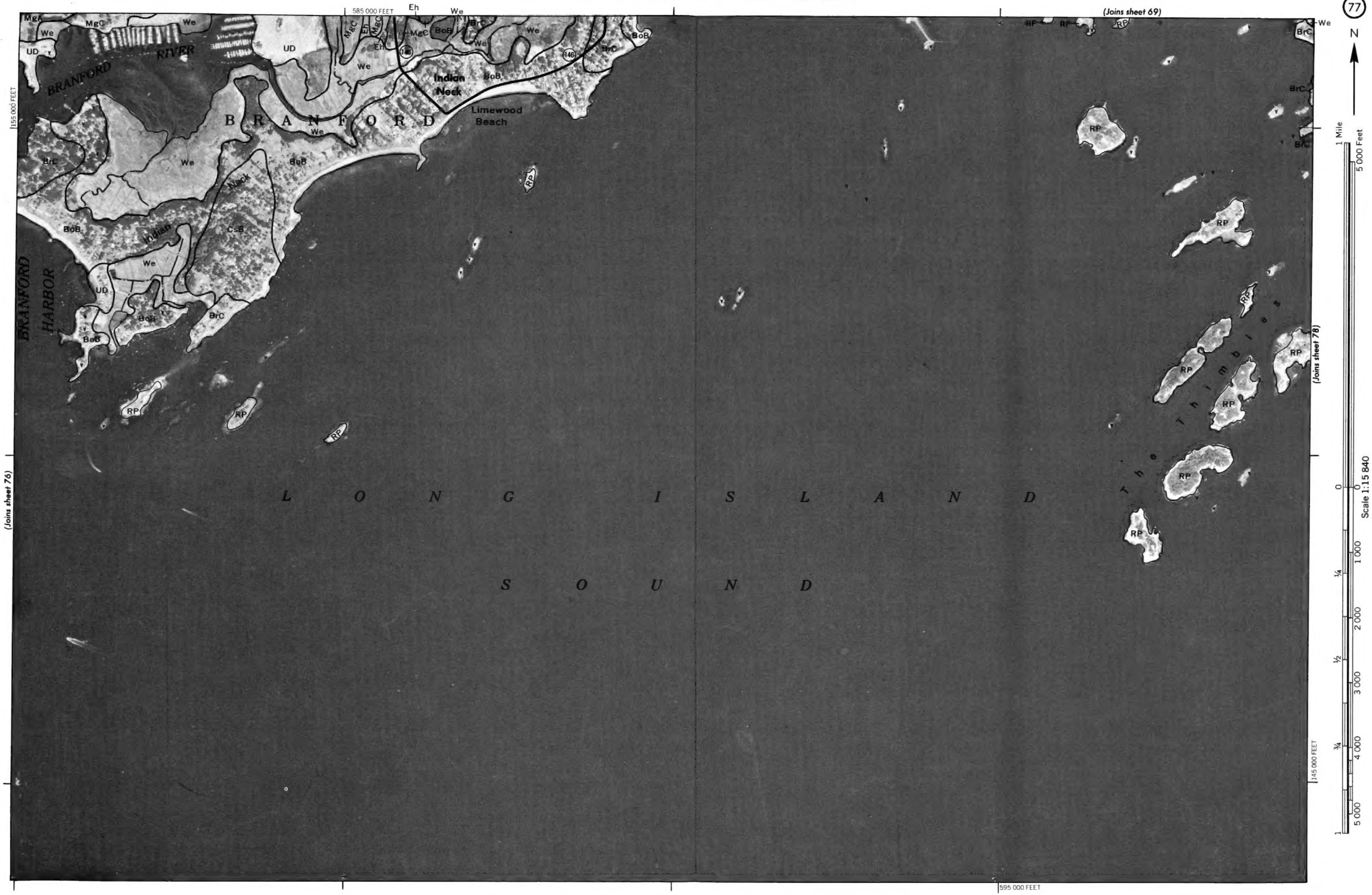
This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

NEW HAVEN COUNTY, CONNECTICUT NO. 75

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



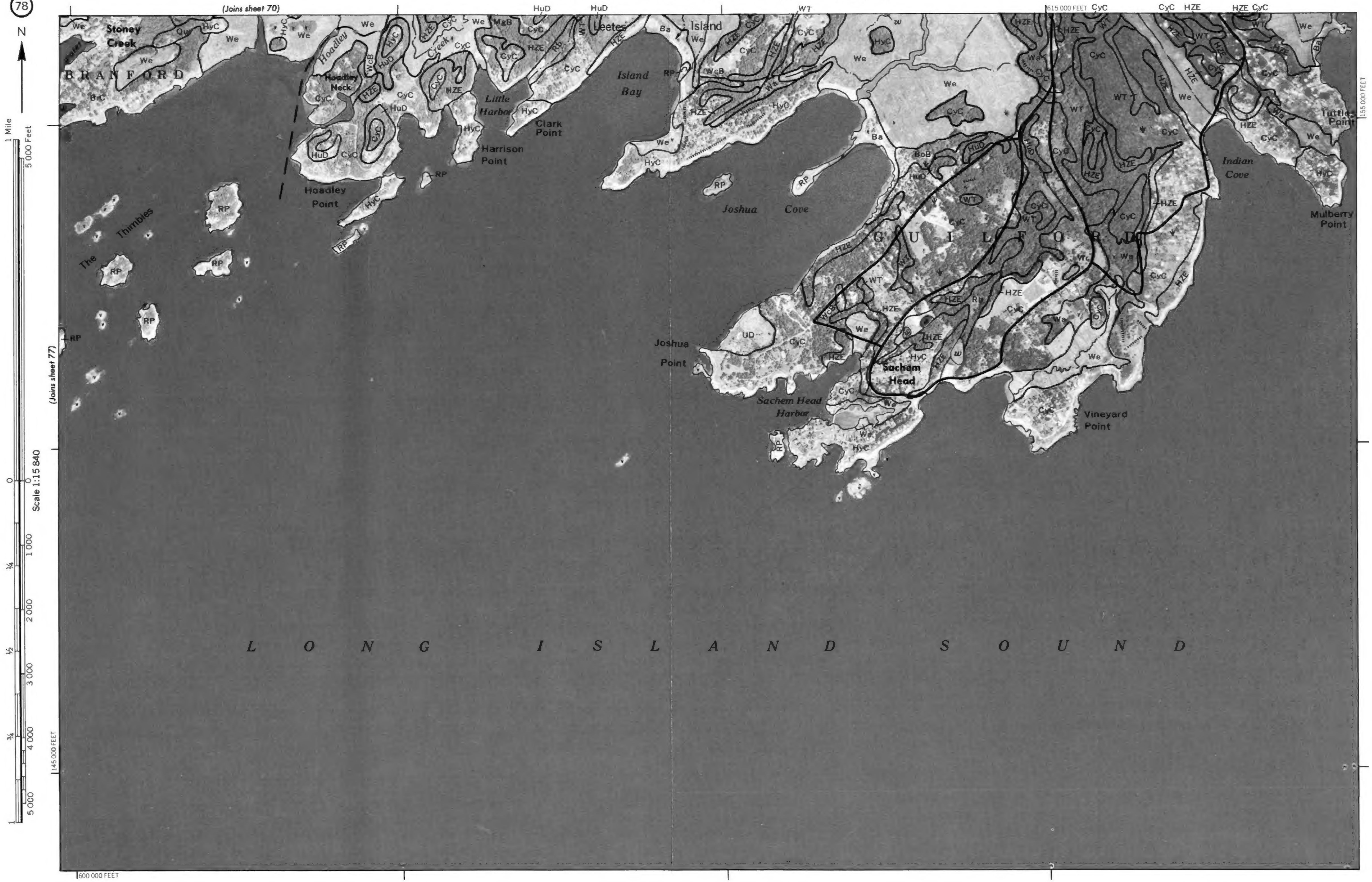
This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies.
Coordinate grid ticks and land division corners, if shown, are approximately positioned.



NEW HAVEN COUNTY, CONNECTICUT NO. 77

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

NEW HAVEN COUNTY, CONNECTICUT — SHEET NUMBER 78



This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

NEW HAVEN COUNTY, CONNECTICUT NO. 79

This map is compiled on 1975 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.